

SONY®

DIGITAL VIDEOCASSETTE PLAYER

DVW-522/522P

CONTROL PANEL EXTENSION KIT
BKDW-510

CONTROL PANEL CASE
BKDW-511

Digital BETACAM™

MAINTENANCE MANUAL Part 1

1st Edition

Serial No. 10001 and Higher (DVW-522)

Serial No. 10001 and Higher (DVW-522P)

警告

このマニュアルは、サービス専用です。

お客様が、このマニュアルに記載された設置や保守、点検、修理など行くと感電や火災、人身事故につながる可能性があります。

危険をさけるため、サービストレーニングを受けた技術者のみご使用ください。

WARNING

This manual is intended for qualified service personnel only.

To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.

Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

AVERTISSEMENT

Ce manuel est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

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Manual Structure

Purpose of this manual

This manual is the maintenance manual of digital videocassette player DVW-522/522P.

This manual describes the maintenance information of this unit, and replacement procedure of plug-in boards.

Contents

The following is a summary of all the sections for understanding the contents of this manual.

Section 1 Installation

Describes installation conditions, connector information for peripheral hardware connections, how to operate switches, setup menus for system setup and installation of BKDW-510/511, etc.

Section 2 Service Overview

Explains the removal and installation of cabinet, the locations of main part, and the fixture and measuring equipment for replacement of plug-in boards.

Section 3 Error Messages

Explains the error messages.

Section 4 Periodic Maintenance and Inspection

Explains the cleaning procedure and periodic check.

As for the replacement procedure of the periodic maintenance parts refer to the “Maintenance Manual Part 2”.

Section 5 Maintenance Mode

Explains the maintenance mode (CHECK mode).

As for the ADJUST mode refer to the “Maintenance Manual Part 2”.

Section 6 Replacement of Plug-in Boards

Explains how to replace the plug-in boards, and how to adjust them after replacement.

As for the replacement of boards except plug-in boards and power block refer to the “Maintenance Manual Part 2”.

Section 7 Block Diagrams

Describes the circuit function of printed circuit board and the overall block diagrams.

As for the block diagrams for every circuit block refer to the “Maintenance Manual Part 2”.

Note

Some figures in this manual are drawn as DVW-510. Please understand in advance.

Relative manual

Besides this “Maintenance Manual Part 1”, the following manuals are available for this unit.

- **Operation Manual (Supplied with this unit.)**

This manual is necessary for application and operation of this unit.

- **Maintenance Manual Part 2 (Not supplied with this unit.)**

This manual describes the information items (adjustments, board layouts, schematic diagrams, detailed parts list, etc.) that premise the service based on parts.

If this manual is required, please contact to Sony’s service organization.

Section 1

Installation

1-1. Operating Conditions

Operating temperature : +5 °C to +40 °C

(Good air circulation is essential to prevent internal heat build-up. Place the unit in location with sufficient air circulation. Do not block the ventilation holes on the cabinet and the rear panel.)

Humidity : 25 % to 80 %

Storage temperature : -20 °C to +60 °C

Locations to avoid : • Areas where the unit will be exposed to direct sunlight or any other strong lights.
• Dusty areas or areas where it is subject to vibration.
• Areas with strong electric or magnetic fields.
• Areas near heat sources.
• Areas where is subjected to electricity noise.
• Areas where is subjected to static electricity noise.

Horizontal condition : Do not slant the front and rear of the unit more than 30°.

Note Fix the unit securely if it is operated at a slant.

1-2. Power Supply

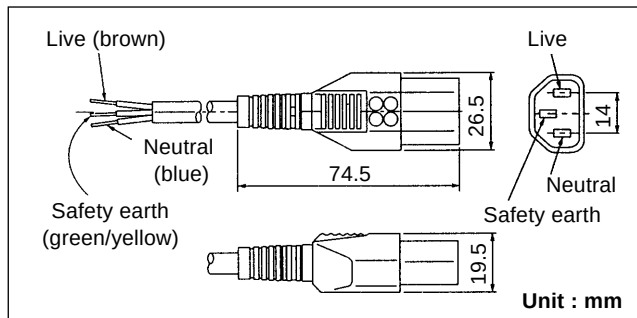
1-2-1. Voltage and Power Requirements

This unit's power line has a switching regulator and is designed for 90 V through 265 V.

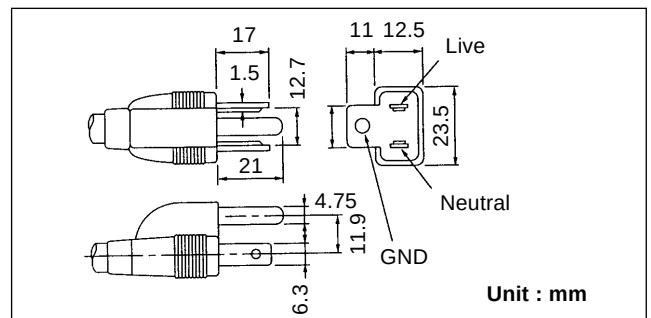
- Power voltage 90 — 265 V AC
- Power frequency 48 — 64 Hz
- Power consumption 150 VA (240 V), 105 W (100 V)

1-2-2. Power Cord

- Length approx. 2.4 m
- Plug



For DVW-522P (EK)



For DVW-522 (UC)

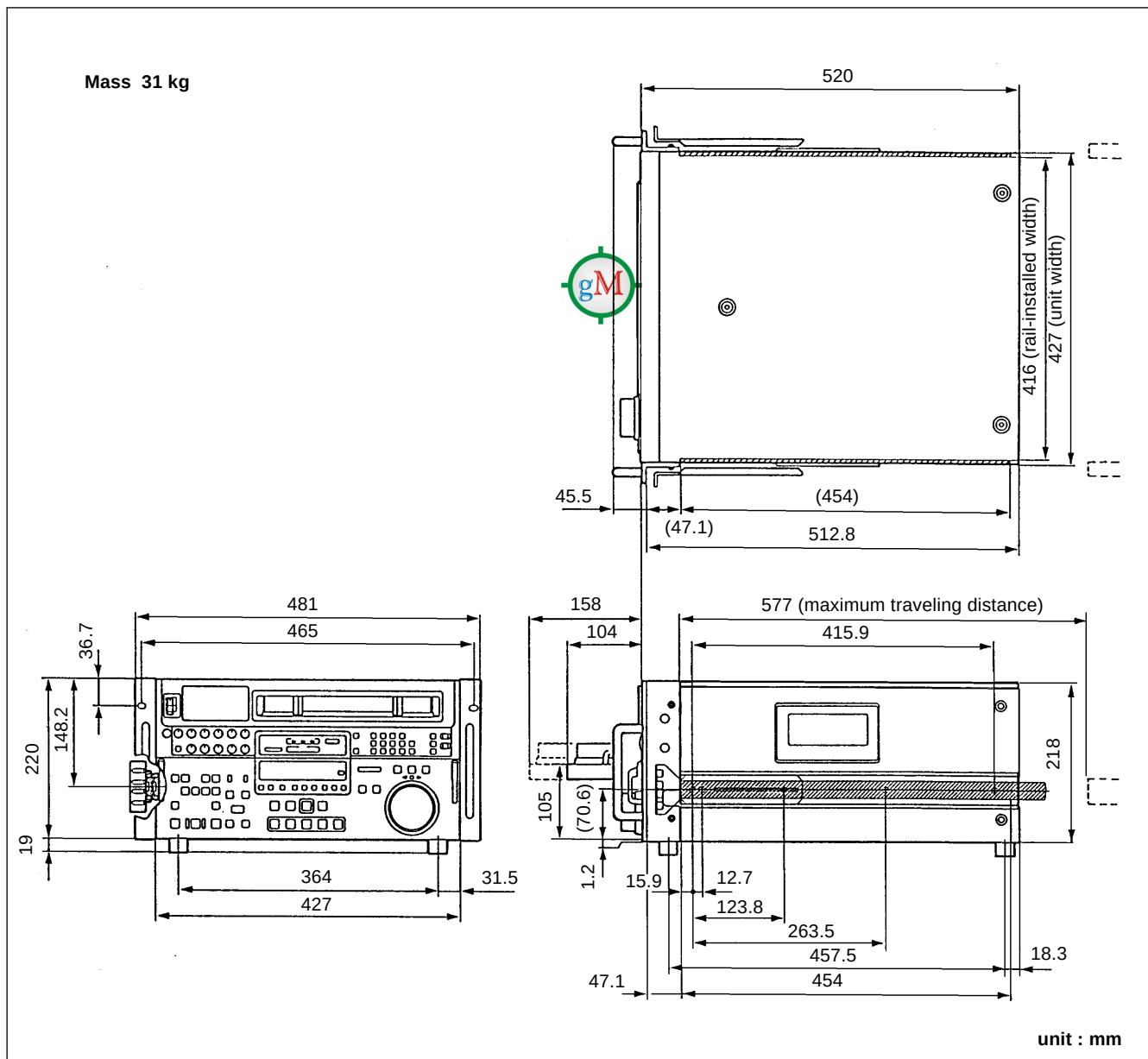
1-3. Installation Space

Notes on installation place

- The rear side must be at least 40 cm away from the walls for ventilation and maintenance.
- Two cooling fans are fitted. If either the intake or exhaust becomes clogged or the fans stop, damage may result to the power unit etc.

The heat sinks provided on each board are rated on the assumption that cooling will be provided by the fans. Consequently, the unit should not be operated too long without fan cooling (such as when the connector panel is opened for checks etc.).

- When the unit is operated on a desk or similar condition, assure that the clearance above the unit is at least 40 cm to provide accessibility to the printed circuit boards and other mechanical parts. Note that it is not necessary to provide the space when the unit is mounted in a rack since the printed circuit boards can be repaired after it is pulled out.



Dimensions when Rack-mounted

1-4. Supplied Accessories and Packing Materials List

Supplied Accessories

Q'ty	Part No.	SP	Description
1pc	1-551-812-11	s	CORD, POWER (for DVW-522)
1pc	1-590-910-11	s	CORD SET, POWER (for DVW-522P)
1pc			OPERATION MANUAL (E)
1pc			OPERATION MANUAL (G) (for DVW-522P)
1pc			OPERATION MANUAL (F) (for DVW-522P)
1pc			MAINTENANCE MANUAL PART1
4pcs	7-682-965-01	s	SCREW +PSW 4x16

Packing Materials

Q'ty	Part No.	SP	Description
1pc	2-990-242-01	s	HOLDER (B), PLUG (for DVW-522)
1pc	3-170-078-01	s	HOLDER (B), PLUG (for DVW-522P)
1pc	3-181-533-01	o	CUSHION (LOWER)
1pc	3-181-534-02	o	CUSHION (UPPER)
1pc	3-181-535-01	o	SPACER (A)
1pc	3-181-536-01	o	SPACER (B)
1pc	3-687-335-01	o	INDIVIDUAL CARTON (for DVW-522)
1pc	3-687-336-01	o	INDIVIDUAL CARTON (for DVW-522P)
1pc	3-701-616-01	o	BAG, POLYETHYLENE
1pc	3-701-619-01	o	BAG, POLYETHYLENE, STANDARD
1pc	3-701-634-00	o	BAG, POLYETHYLENE

1-5. Rack Mounting

The unit can be mounted in a 19-inch standard rack.
It is recommended to use the following kit.

Rack Mount Kit: RMM-110 (optional accessory)

or

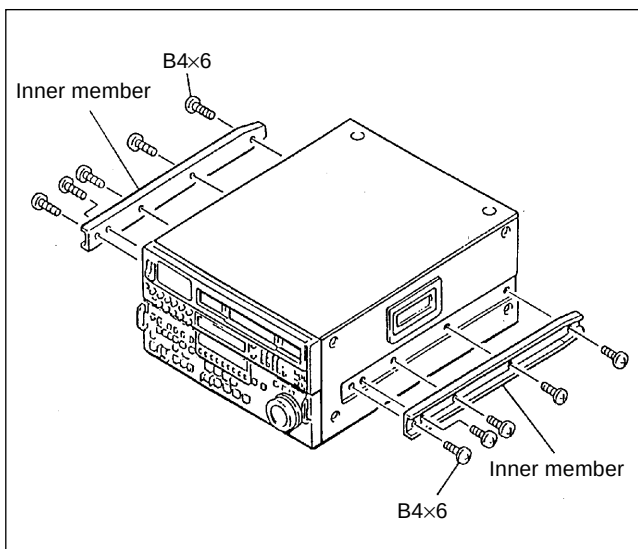
RACK-MOUNT SLIDES: MODEL 305

slide length 558.8 mm (22 inch)
(ACCURIDE)

Notes for rack mounting

- When several VTRs are mounted in a rack, keep the spaces between the each VTRs in the rack 1U or more. It is recommended to install a fan for ventilation. Good air circulation is essential to prevent internal heat build-up in a rack (5°C to 40°C must be met for all units).
- Never remove an upper lid and bottom plate during rack mounting.
- Be sure to secure the rack to the floor to avoid accidents when a unit is pulled out.
- Connect long enough cables on the connector panel, considering that the unit is pulled out.

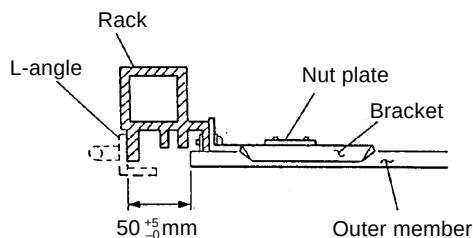
1. Remove the five screws on right and left side panels.
2. Install the inner members of the slide rails to the right and left side panels with the screws removed.



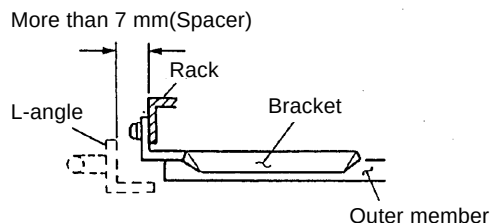
Installation of Inner Member

3. Remove the four feet on the bottom plate.
If the unit is mounted in the rack with the feet attached, they will contact the lower and the upper portions of the rack and the unit cannot be pulled out from the rack.
4. Install the outer member brackets of the slide rails to the rack. Adjust the distance from the edge of the slide rail to the outside of the rack so that it meets the specifications in the Fig. 1 or Fig. 2.

«Fig. 1»

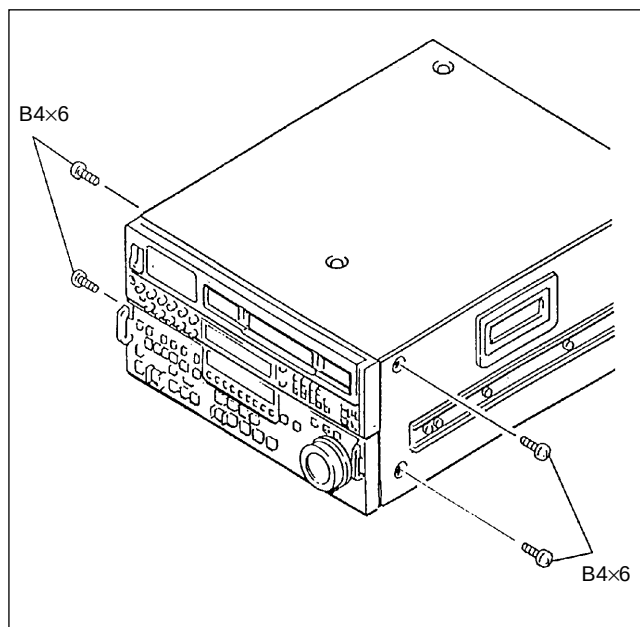


«Fig. 2»



Examples of Outer Members Installation

5. Remove the four screws on the right and left side panels. (Be careful not to lose these four screws.)

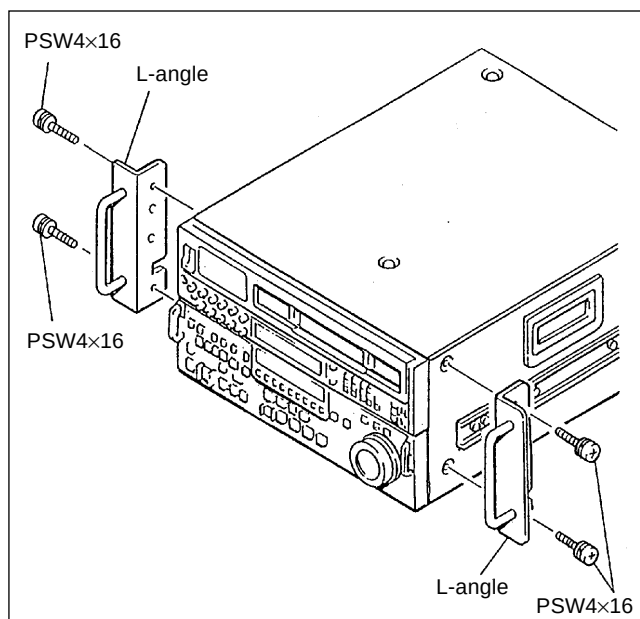


Removal of Screws on Left and Right Side Panels

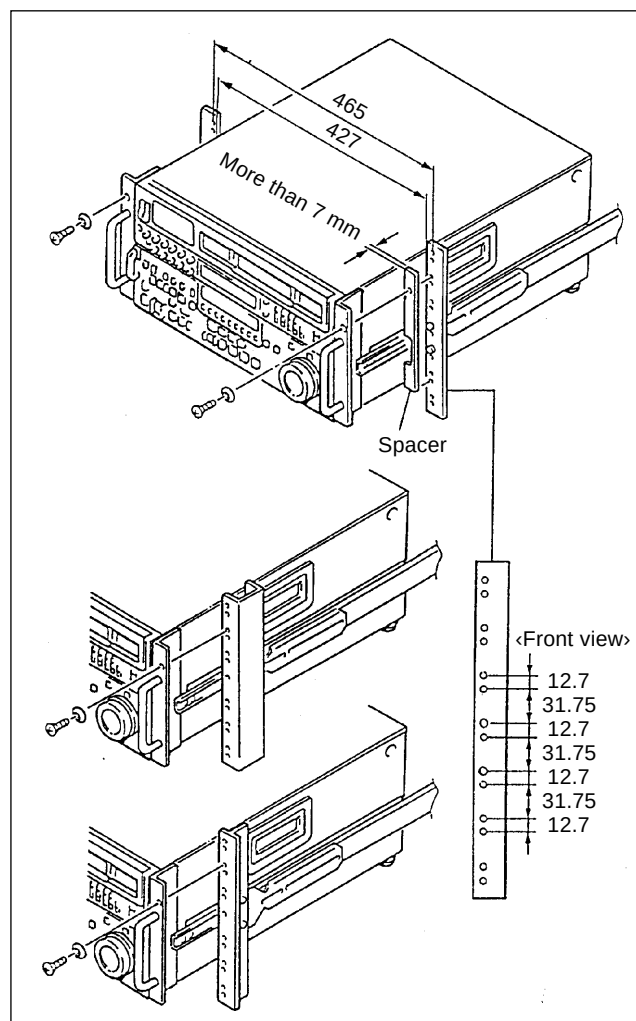
6. Install the L-angles to the holes described in step 5 with the supplied screws (PSW4x16) for these L-angles.

CAUTION

Never use screws PSW4x16 to install the right and left side panels without L-angles. Be sure to install the panels with the screws B4x6 removed in step 5. Screws for L-angles are longer than screws for only panels. PSW4x16 without L-angles may cause trouble in the unit.



Installation of L-angles



Rack Mounting

1-6. Matching Connectors

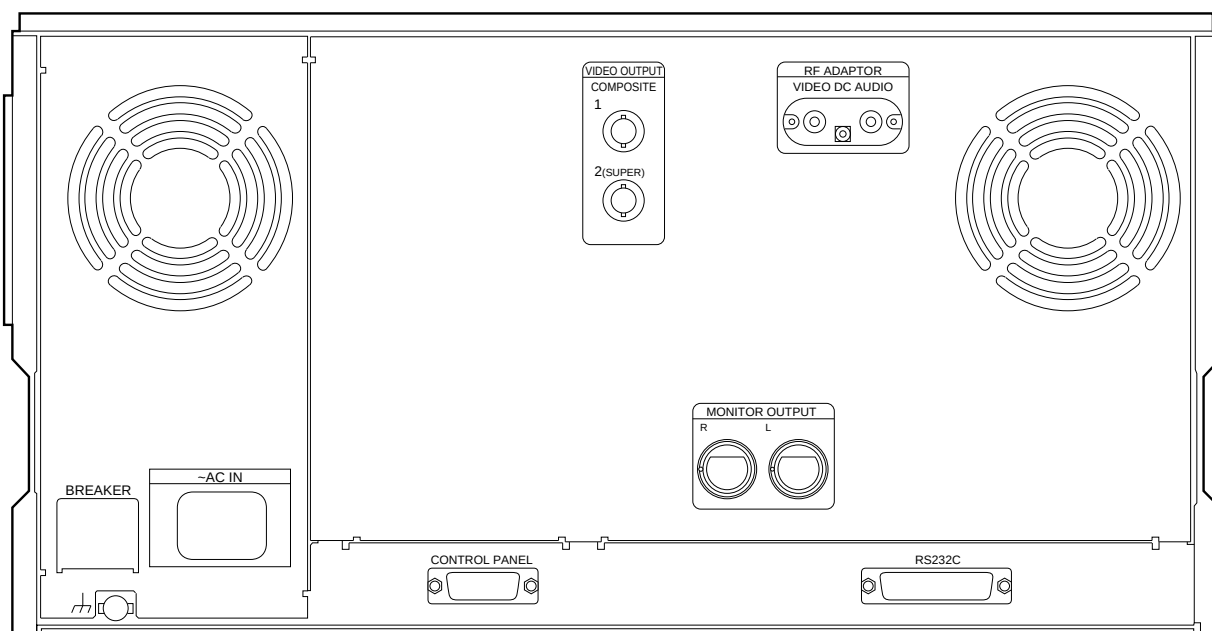
When external cables are connected to the connector on a connector panel during maintenance, the hardware listed below (or the equivalents) must be used.

VTR Side Connector Panel Indication	Matching Cable Connector/Cable Connector	Sony Part No.
VIDEO OUTPUT	BNC 75 Ω , MALE	————
MONITOR OUTPUT	XLR 3P, FEMALE	1-508-083-00
HEADPHONES	JM-60 stereo phone plug	————
CONTROL PANEL	D-SUB 15P, MALE JUNCTION SHELL 15P	1-566-355-11 ^(NOTE 1) 1-561-929-00
RS232C	D-SUB 25P, MALE	1-566-356-11
VIDEO DC AUDIO	RFU ADAPTOR AV CABLE	————

(NOTE 1) This connector is supplied with optional accessory BKDW-510.

1-7. Signal Outputs

«Rear Panel»



OUTPUT

RF ADAPTOR

VIDEO RCA jack, 1.0 V_{p-p}, 75 Ω , sync negative (for character superimpose)

DC +5 V

AUDIO RCA jack, -10 dBu, high impedance, unbalanced

COMPOSITE BNC $\times$ 2 (including 1 for character superimpose)
1.0 V_{p-p}, 75 Ω , sync negative

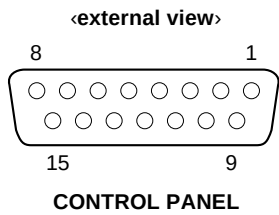
MONITOR OUTPUT (R/L) XLR 3-pin $\times$ 2
+4 dBm (600 Ω load), low impedance, balanced

CONTROL PANEL D-SUB 15-pin connector

RS232C D-SUB 25-pin connector

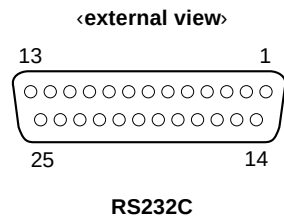
HEADPHONES JM-60 stereo phone jack
(Upper Control Panel) up to -12 dBu (8 Ω load), unbalanced

CONTROL PANEL: 15-pin (female)



Pin No.	Signal
1	KEY RX (–)
2	KEY RX (+)
3	NC
4	REG +8 V
5	REG +8 V
6	REG +8 V
7	REG +8 V (2)
8	NC
9	GND
10	KEY TX (+)
11	NC
12	KEY TX (–)
13	GND
14	GND
15	GND

RS232C: 25-pin (female)



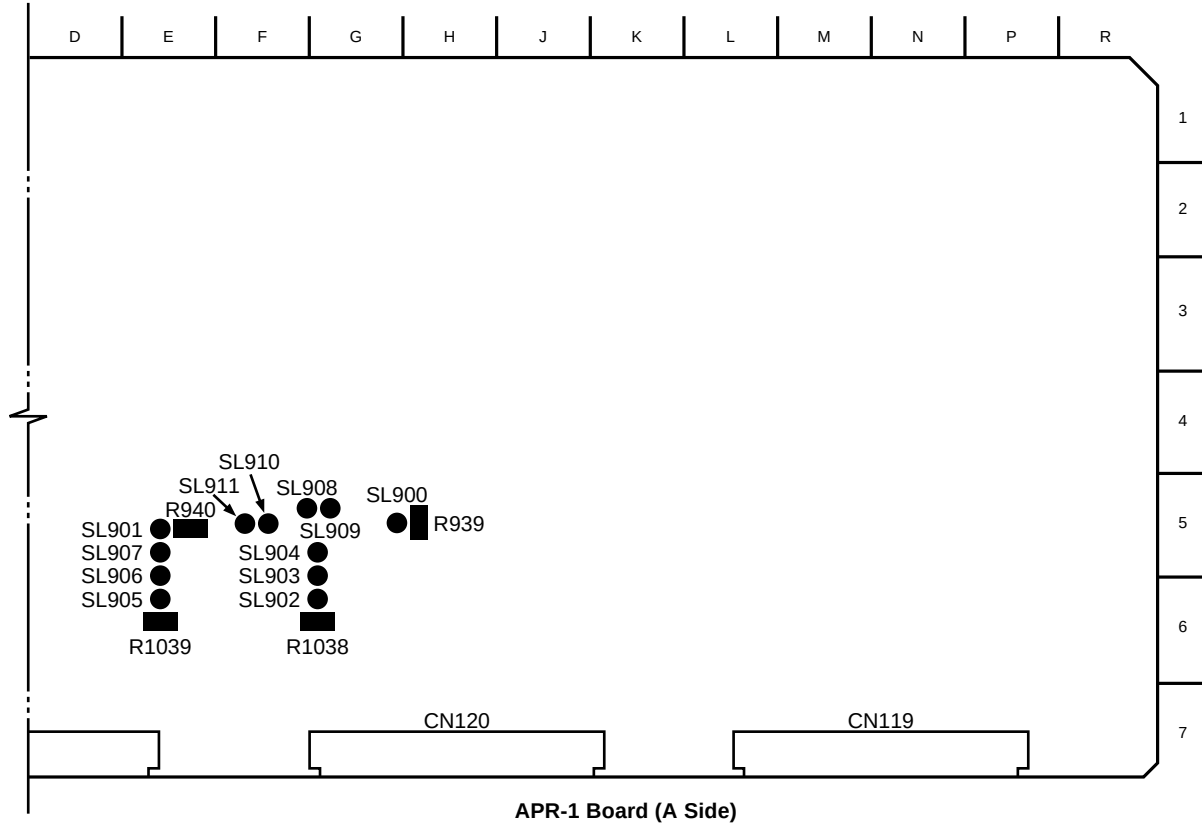
Pin No.	Signal
1	FG; Frame Ground
2	TXD; Transmitted Data (Output)
3	RXD; Received Data (Input)
4	RTS; Request to Send (Output)
5	CTS; Clear to Send (Input)
6	DSR; Data Set Ready (Input)
7	SG; Signal Ground
8	DCD; Data Carrier Detect (Input)
9	NC
10	NC
11	NC
12	NC
13	NC
14	NC
15	NC
16	NC
17	NC
18	NC
19	NC
20	DTR; Data Terminal Ready (Output)
21	NC
22	NC
23	NC
24	NC
25	NC

1-8. Switch/Shorting Land Settings on the Boards

CAUTION

Never change the settings of the factory use switches.

APR-1 board



APR-1 board, on-board shorting lands and resistor selection

Selecting output level

Audio Channel	Ref. No.	Output Level (dBm/600 Ω)				Fine Adjustment (Address No.)
		+4 ¹⁾	0	−3	−20	
MONITOR L-CH	SL902	OPEN	SHORT	OPEN	OPEN	RV901 (F-5)
	SL903	OPEN	OPEN	SHORT	OPEN	
	SL904	OPEN	OPEN	OPEN	SHORT	
	R1038	MOUNT	NO MOUNT	NO MOUNT	NO MOUNT	
MONITOR R-CH	SL905	OPEN	SHORT	OPEN	OPEN	RV902 (E-5)
	SL906	OPEN	OPEN	SHORT	OPEN	
	SL907	OPEN	OPEN	OPEN	SHORT	
	R1039	MOUNT	NO MOUNT	NO MOUNT	NO MOUNT	

1) Factory Setting

Selecting fixed or variable MONITOR output level

Audio Channel	Ref. No.	Selection	
		Level Variable ²⁾	Level Fixed ¹⁾
MONITOR	SL900	SHORT	OPEN
L-CH	R939	NO MOUNT	MOUNT
MONITOR	SL901	SHORT	OPEN
R-CH	R940	NO MOUNT	MOUNT

1) Factory Setting

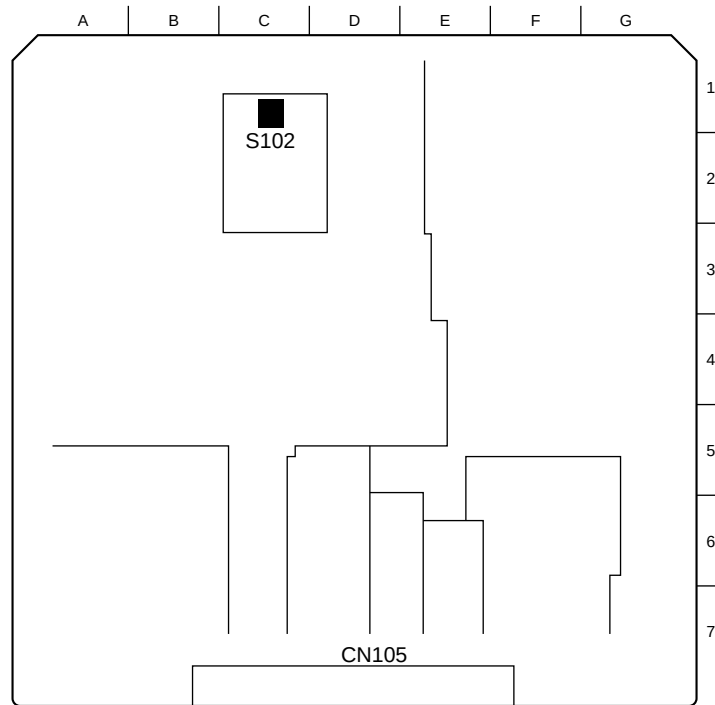
2) When the level variable is selected, the level is adjusted with the PHONES level control.

Selecting output headroom

Audio Channel	Ref. No.	Output Headroom (dB)			Fine Adjustment (Address No.)
		–16	–18	–20 ³⁾	
MONITOR	SL908	OPEN	SHORT	OPEN	RV901 (F-5)
L-CH	SL909	SHORT	OPEN	OPEN	
MONITOR	SL910	OPEN	SHORT	OPEN	RV902 (E-5)
R-CH	SL911	SHORT	OPEN	OPEN	

3) Factory Setting

CUE-1 board

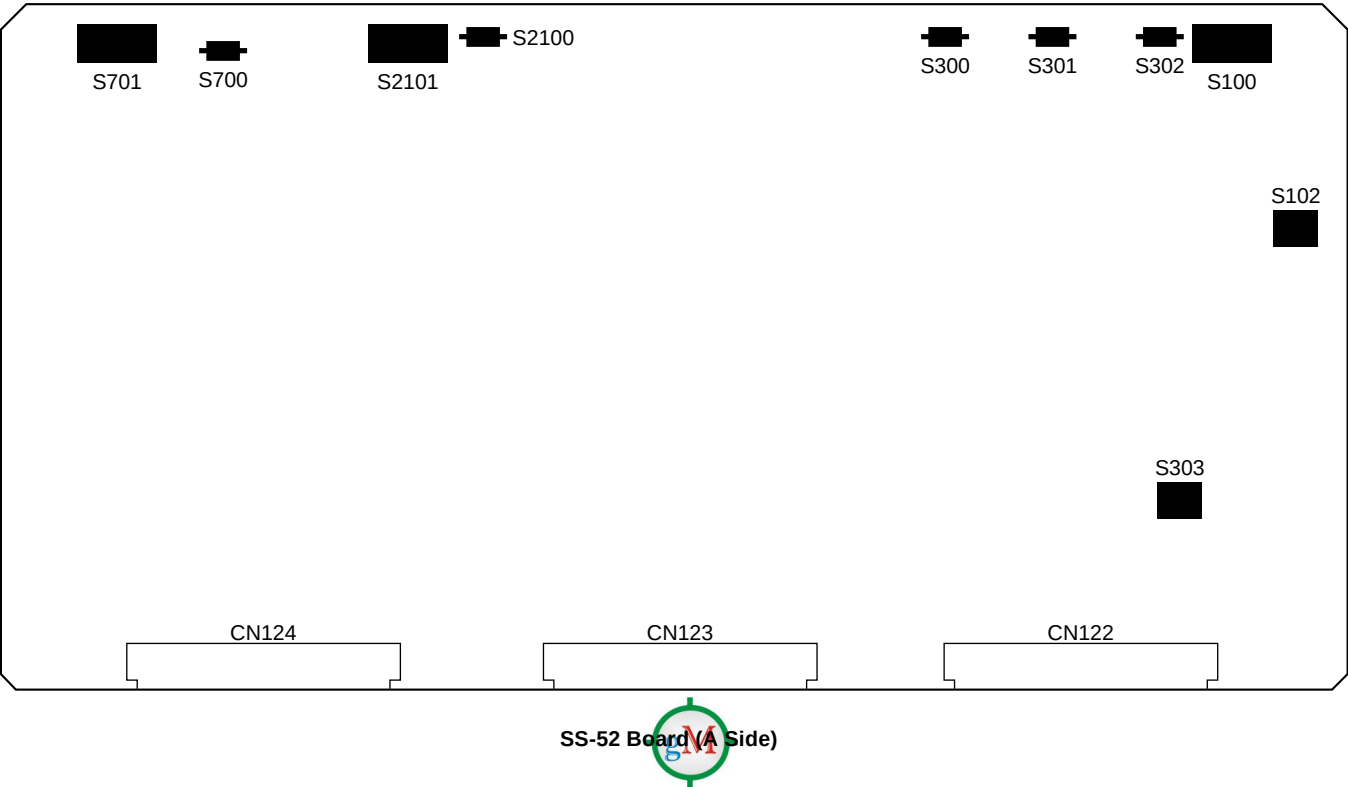


CUE-1 Board (A Side)

CUE-1 board, on-board switch

Switch No.	Name	Description	Factory Setting
S102-1	CUE/CH-2 AUDIO	By coupling with RV901 on the CUE-1 board, adjust the CUE head amp high frequency response (head vibration). (Refer to the Maintenance Manual Part 2 Vol-1.) These switches are used in audio head dumping adjustment. If the switch settings are changed when this adjustment is not performed, audio frequency response may be failed.	When the unit is shipped, these switches are set to the position based on the adjustment condition.
S102-2	HEAD TUNE ADJ. SWITCH		

SS-52 board



SS-52 board, on-board switch

Switch No.	Name	Description	Factory Setting
S100-1	SETUP MENU MODE	OFF (OPEN): Main menu ON (CLOSE): System menu	OFF (OPEN)
S100-2 S100-4	—————	Factory use	OFF (OPEN)
S100-5	CUSTOMIZE MENU MODE ENABLE	Select whether to put the unit into customize menu mode. OFF (OPEN): Customize menu mode disabled. ON (CLOSE): Customize menu mode enabled.	OFF (OPEN)
S100-6	—————	Factory use	OFF (OPEN)
S100-7	MAINTENANCE MODE ACCESS ENABLE	Select whether to put the unit into maintenance mode with only front panel operation. OFF (OPEN): Operation disabled. ON (CLOSE): Operation enabled.	OFF (OPEN)
S100-8	BANK3 WRITE PROTECTION	OFF(OPEN): Enables the write of data in BANK3. ON(CLOSE): Disables the write of data in BANK3. The message below is displayed on the monitor screen when data is changed at that time. !!! PROTECTED !!!	OFF (OPEN)

SS-52 board, on-board switch

Switch No.	Name	Description	Factory Setting
S102	CAUTION Never change the settings of S102 switch since each switch is set according to the characteristics.		
S102-1	—————	Undefined	—————
S102-2	—————	Undefined	—————
S102-3	—————	ON: U.S.A. and Canada OFF: Japan	—————
S102-4	—————	ON: PAL OFF: NTSC	—————
S300	ADJ 1	Operation key switches for maintenance mode.	—————
S301	ADJ 2		
S302	ADJ 3		
S303-1	—————	Undefined	—————
S303-2	—————	Undefined	—————
S303-3	—————	Undefined	—————
S303-4	—————	Undefined	—————
S700	REEL POSITION	Pressing this switch enables the changing of the reel position without installing the cassette compartment in the unit.	—————
S701-1	TRCON VR DISABLE	Select whether to enable TRACKING VR operation or not. OFF (OPEN) : Tracking VR operation enabled. ON (CLOSE) : Tracking VR operation disabled.	ON (CLOSE)
S701-2 S701-8	—————	Factory use	OFF (OPEN)
S2100	DE-DISTORTION	When this switch is pressed, de-distortion (removal of residual distortion from DT heads) is started.	momentary operation
S2101-1 S2101-8	—————	Factory use	OFF (OPEN)

1-9. Search Dial Mode Switching

There are two kinds of operation to switch the search dial of this unit to jog mode or shuttle mode. Set the search dial of this unit to your operation.

Search dial pressing

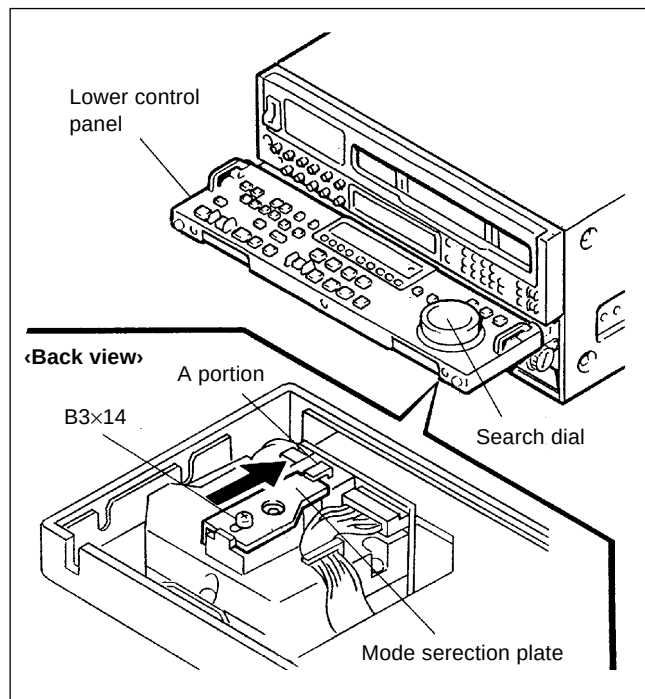
Press the dial, the VTR toggles between shuttle and jog modes.

SHUTTLE/JOG button selecting

Press the SHUTTLE button, the VTR is switched to shuttle mode. Press the JOG button, the VTR is switched to jog mode.

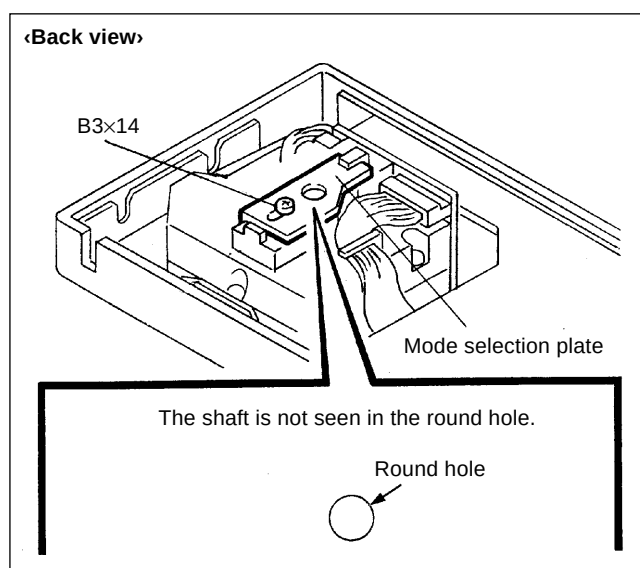
Prohibiting search dial pressing from switching the mode

1. Turn off the POWER.
2. Fix a lower control panel at 90 degrees.
(Refer to Section 2-6.)
3. Loosen a screw on the backside of the search dial as shown in the figure.
4. Slide the mode selection plate in the direction indicated by the arrow until it touches the A portion.



Sliding the Mode Selection Plate

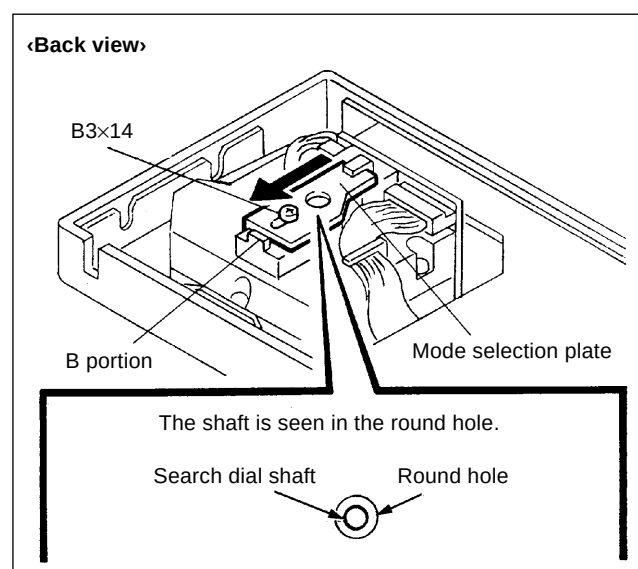
5. Check that the shaft of the search dial is not seen in the round hole of the mode selection plate and then tighten the screw.



The State that the Mode Cannot Be Switched

Allowing search dial pressing to switch the mode

6. Perform the steps 1 to 3.
7. Slide the mode selection plate in the direction indicated by the arrow until it touches the B portion.
8. Check that the shaft of the search dial is seen in the round hole of the mode selection plate and then tighten the screw.



The State that the Mode Can Be Switched

1-10. Installation of BKDW-510/511

By installing a control panel extension kit (BKDW-510), the videocassette player can be controlled from a remote location (10 m).

To use the lower control panel of the DVW series as a desk-type remote control unit, control panel case BKDW-511 is required.

Components

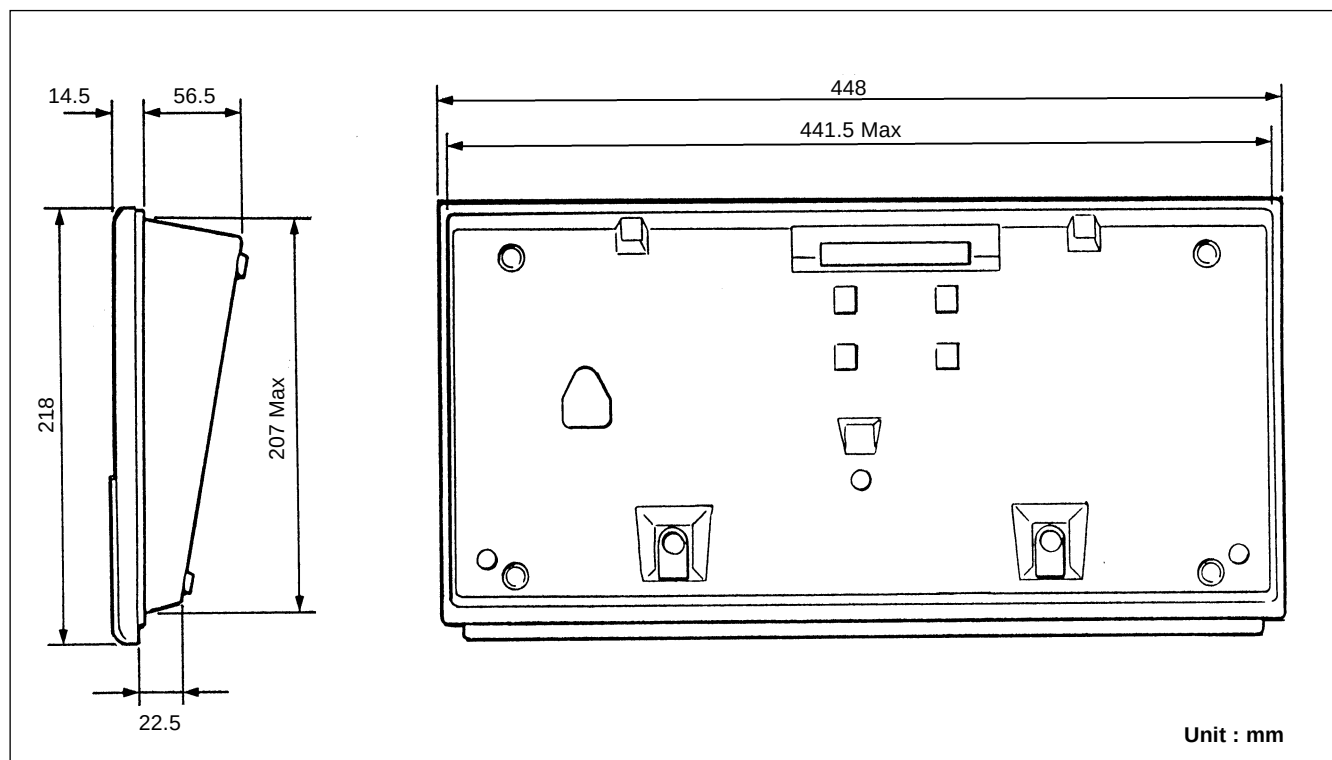
BKDW-510: Blank panel

Remote cable with 15-pin connector

BKDW-511: Control panel case

Cord stopper

Harness clumper



Unit : mm

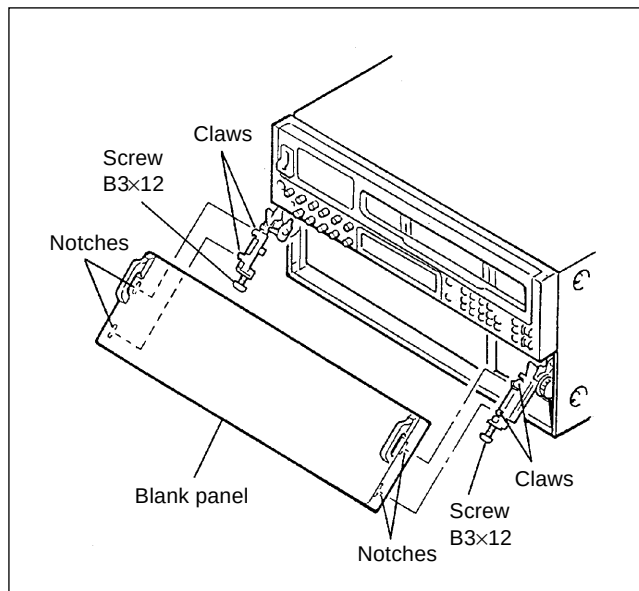
Dimensions of Control Panel Case

Blank panel installation

1. Remove the lower control panel assembly. (Refer to Section 2-7.)
2. Fix the both arms at an angle of 45°.
3. Set the notches of the blank panel with the claws of the each arm and tighten two screws until a click sounds.

Note

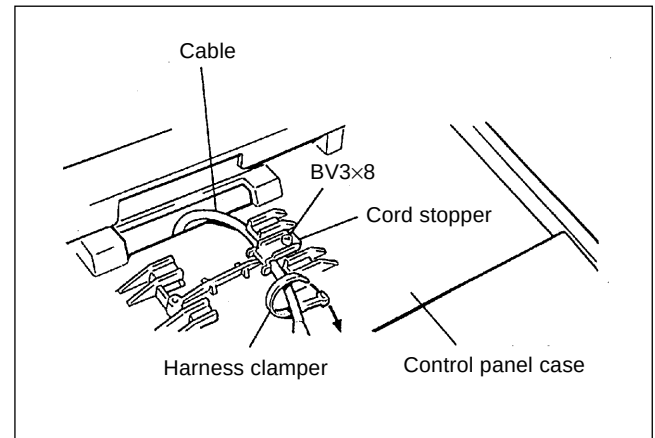
Push the head of the two screws when the hook does not move smoothly and when the panel is difficult to set. This facilitates the setting.



Installation of Blank Panel

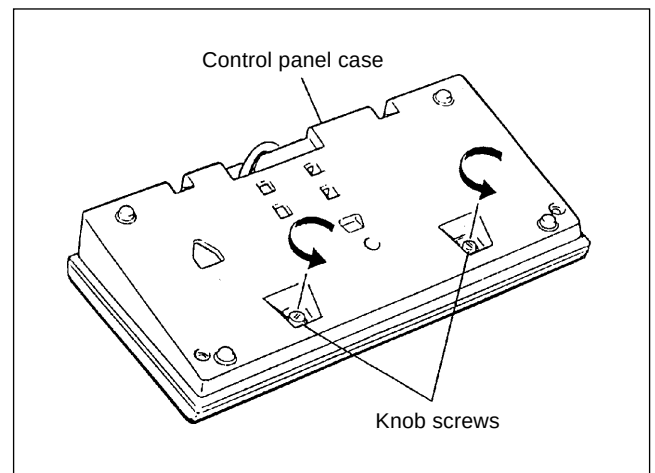
Assembling of remote control unit

1. Pass the connector at the end of the remote cable with a 15-pin connector through the control panel case and tighten the screw of the cord stopper to fix.
2. Wind the harness clumper round a cable and fix the cable so that it does not move.



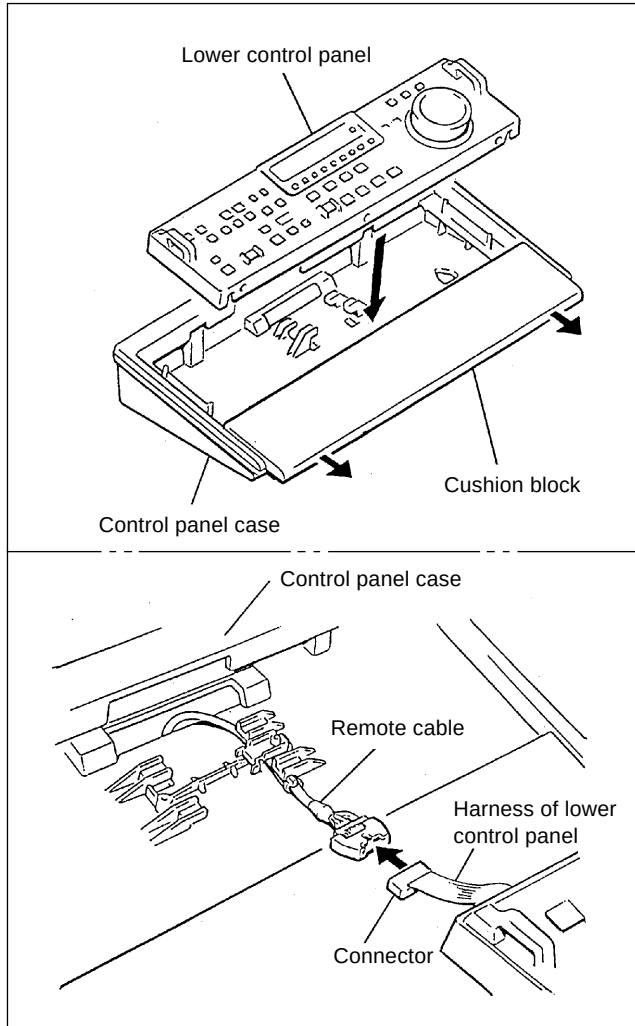
Fixing of Remote Cable

3. Loosen the two knob screws at the bottom of the control panel case by one or two turns.



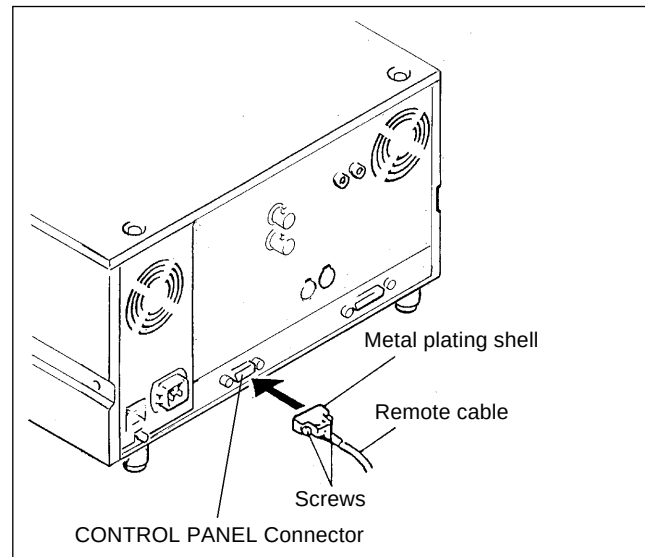
Turning of Knob Screws

4. Pull out the cushion block of the control panel case forward.
5. Connect the harness of the control panel to the connector at the end of the remote cable fixed in step 2.
6. Put the lower control panel into the control panel case.
7. Return the cushion block to the former position and tighten the two knob screws at the bottom to fix.



Installation of Lower Control Panel

8. Tighten the two screws of the metal plating shell and connect the remote cable to the connector (CONTROL PANEL) on the connector panel.



Connection of Remote Cable

Setting After Installation

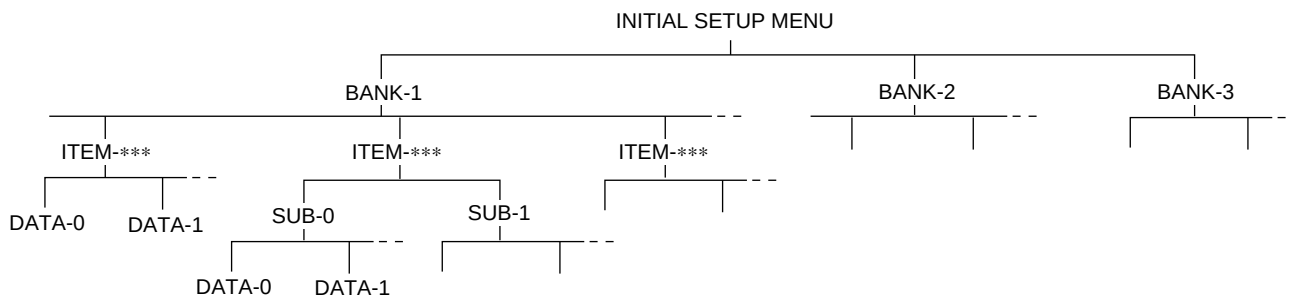
- This unit is set to the EXT operation using the CONTROL PANEL switch on the system setup panel.

1-11. Setup Menu

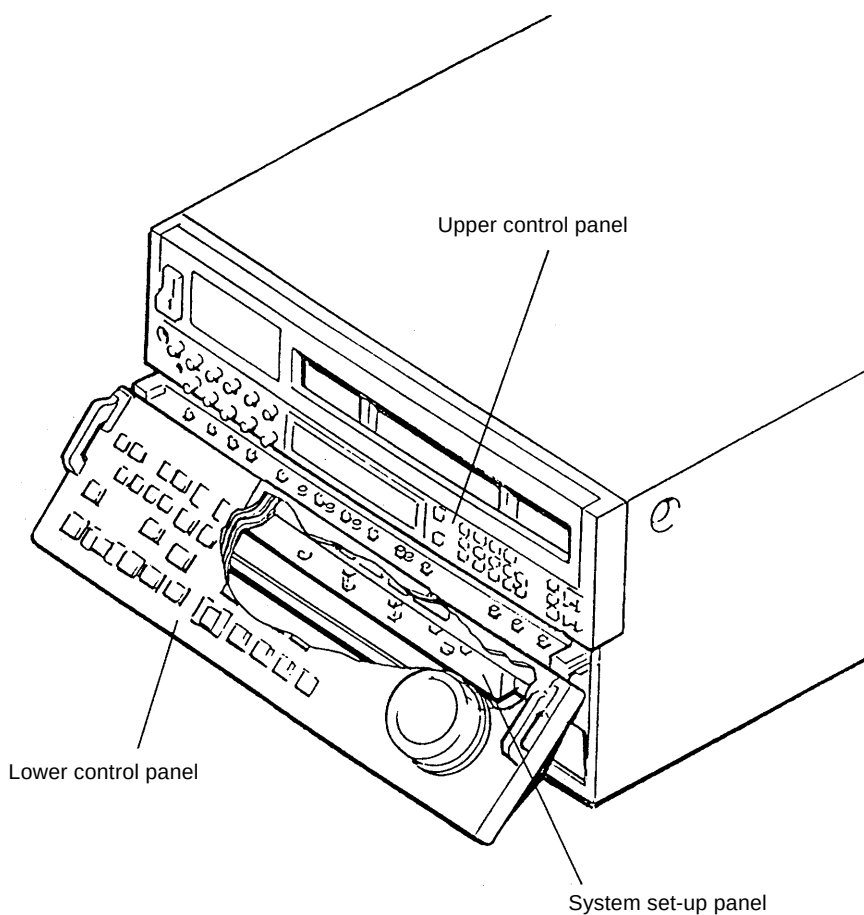
The memory area of the INITIAL SETUP MENU of this unit comprises of three banks.

Each bank contains identical ITEMS which can be independently set. For this reason, the VTR operation setups can be changed with the switchover of the banks.

Some ITEMS have the several SUB-ITEMs. Each SUB-ITEM has DATA as shown below.



Name of Each Panels



Various selector switches are provided on the system setup panel, and printed circuit board. Each mode can be changed by selecting these switches. Moreover, each mode can be also changed by the operation of the setup menu described later.

The buttons used in modifying the setup are described below.

① MENU Lamps 1,2,3 (Upper control panel)

The MENU lamps indicate on which bank the VTR is operating.

The bank that is lighted, is the selected bank at present.

② Time Counter Display (Lower control panel)

The Time Counter displays the ITEM No., SUB-ITEM No., and DATA No.

Since the time counter indicates the minimum data required for modification in the menu mode, the setup can be modified without viewing the video monitor.

③ MENU Button (Lower control panel)

Use the MENU button to enter and exit the menu mode.

When this button is pressed while modification of the setup is in progress, the contents which you have modified the ITEMS so far are canceled and the unit exits the setup menu mode.

When this button is pressed again after exiting the setup menu mode, the unit enters the setup menu mode again starting from the ITEM that was displayed before exiting.

④ SET Button (Lower control panel)

Press the SET button to store the modified DATA in the memory bank where the MENU lamp is lit. The unit exits the menu mode.

⑤ STOP Button (Lower control panel)

Use the STOP button in the setup menu mode to enter individual displays of the ITEM which has SUB-ITEMS and select a SUB-ITEM.

Turn the search dial while pressing the STOP button to select a SUB-ITEM.

⑥ TC Button (Lower control panel)

By pressing this button in the setup menu mode, the menu jumps to H01 which is the top ITEM of the menu.

⑦ PLAY Button (Lower control panel)

Use the PLAY button in the menu mode to display the ITEM-F00 SERIES.

Turn the search dial while pressing the PLAY button to select an ITEM of the ITEM-F00 SERIES.

⑧ Search Dial (Lower control panel)

Pressing this dial switches between the SHUTTLE and JOG modes alternately. The SHUTTLE or the JOG lamp lights accordingly.

When the search dial is in the JOG mode (unclicked position), the ITEM, SUB-ITEM and DATA can be modified.

⑨ VAR Button (Lower control panel)

To jump to the top item of the next (or preceding) category, turn the search dial while pressing this button.

⑩ JOG Button (Lower control panel)

Press the JOG button once so that the search dial enters the JOG mode, and the JOG lamp lights.

Turn the search dial while pressing the JOG button to enter individual displays of each ITEM and modify the data. (The same function as the SHUTTLE button)

⑪ SHUTTLE Button (Lower control panel)

Turn the search dial while pressing the SHUTTLE button to enter individual displays of each ITEM and modify the data. (The same function as the JOG button)

⑫ RESET Button (Lower control panel)

Press RESET button in the menu mode, the menu data (only the memory bank whose the MENU lamp lights) is all returned to the factory-setting state and the system exits the menu mode.

⑬ SET UP SELECT Switch (System set-up panel)

When the POWER is turned on, the VTR operates according to the bank settings selected with this switch.

When the unit is in the menu mode, the contents of each bank can be checked, modified and also the banks can be switched with this switch.

⑭ Switch S100-1 (SS-52 Board)

Set this switch to ON (CLOSE) when displaying the system menu (all the ITEMS from the ITEM-713).

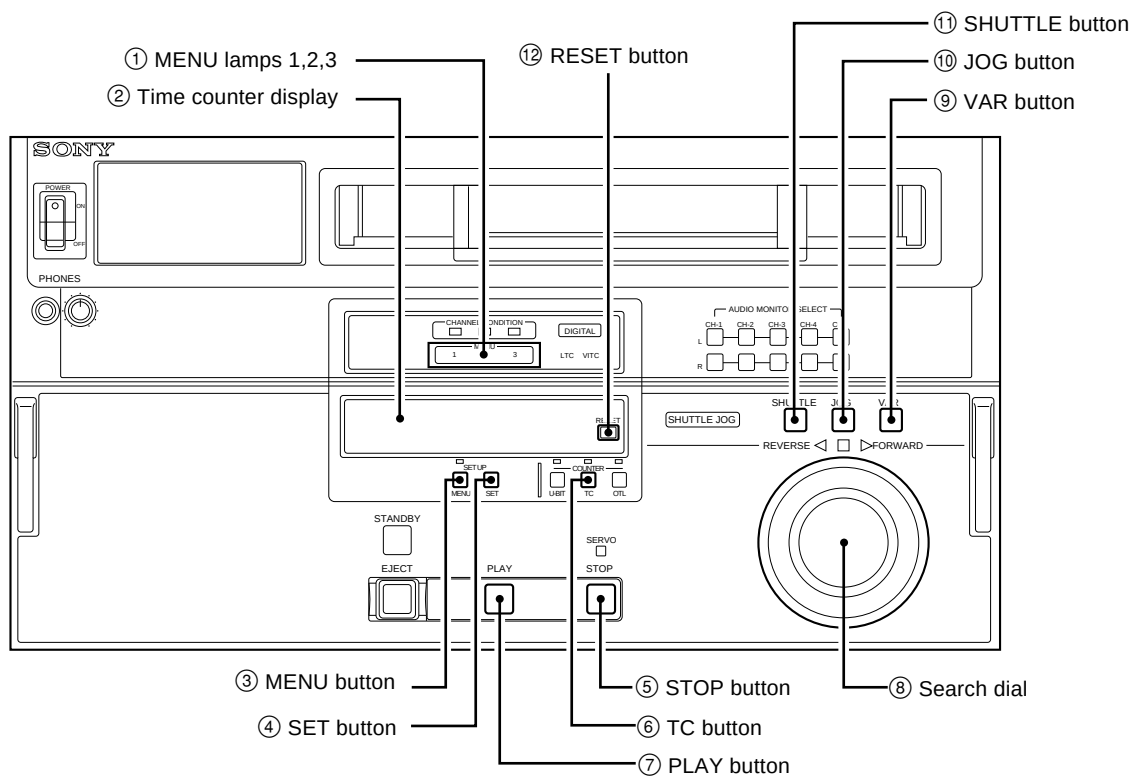
⑮ Switch S100-5 (SS-52 Board)

Set this switch to ON (CLOSE) when executing the customize menu mode.

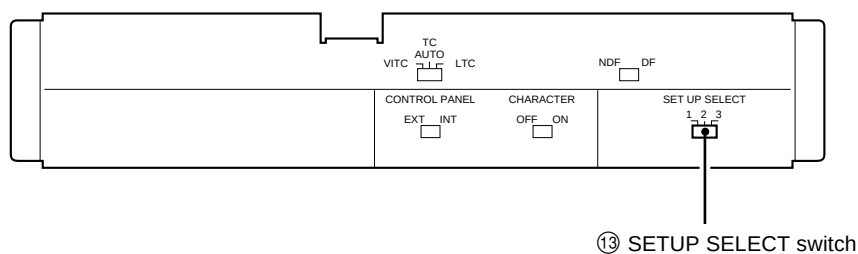
⑯ Video Monitor

When the CHARACTER switch on the system setup panel is set to ON, the information on ITEM, SUB-ITEM, and DATA is superimposed on the monitor screen that is connected to the VIDEO OUTPUT COMPOSITE 2 or RF ADAPTOR VIDEO connector.

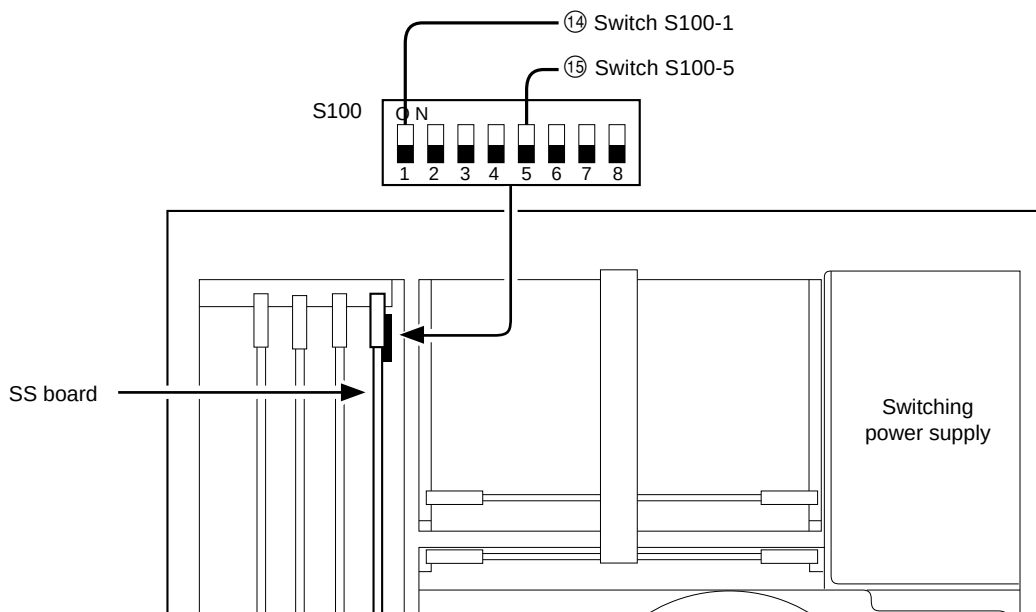
Upper/Lower Control Panel



System Set-up Panel



SS-52 Board



1-11-1. Setup Menu Items

The setup menu consists of a Main menu and System menu.

The menu list is shown below.

The setup menu content depends on the ROM version. For details, refer to 1-11-2.

Check the ROM version with the maintenance mode. (Refer to Section 5.)

Main menu

ITEM-H00 SERIES : HOURS METER PARAMETER

H01: OPERATION HOURS

H02: DRUM RUNNING HOURS

H03: TAPE RUNNING HOURS

H04: THREADING COUNTER

H12: DRUM RUNNING HOURS (resettable)

H13: TAPE RUNNING HOURS (resettable)

H14: THREADING COUNTER (resettable)

ITEM-000 SERIES : OPERATIONAL PARAMETER

002: CHARACTER H-POSITION

003: CHARACTER V-POSITION

005: DISPLAY INFORMATION SELECT

007: TAPE TIMER DISPLAY

009: CHARACTER TYPE

011: CHARACTER V-SIZE

012: CONDITION DISPLAY ON VIDEO MONITOR



ITEM-100 SERIES : OPERATIONAL PANEL PARAMETER

101: SELECTION FOR SEARCH DIAL ENABLE

116: JOG DIAL RESPONSE

System menu

ITEM-700 SERIES : VIDEO CONTROL PARAMETER

713: VIDEO SETUP REFERENCE LEVEL

ITEM-F00 SERIES : ADJUSTMENT USE ONLY

F13: TRACKING CONTROL VIA SEARCH DIAL

1-11-2. Details of the Setup Menu

The numbers enclosed in the ☐ under the DATA column indicate the factory preset settings.

ITEM-H00 SERIES: HOURS METER PARAMETER

ITEM No.	TITLE	DATA No.	DISPLAY	Description
H01	OPERATION HOURS	No selection item		The accumulated power ON time is displayed on the timer counter in 10-hour units. (NOTE) The accumulated power ON time is displayed in 1-hour units on the timer counter while the JOG/SHUTTLE button on the lower control panel is pressed. However, it is displayed in 1-hour units on the monitor screen without pressing the JOG/SHUTTLE button.
H02	DRUM RUNNING HOURS	No selection item		The accumulated drum running hours while the mechanism stays in the threading-end position, is displayed on the timer counter in 10-hour units. (NOTE) The accumulated drum running hours are displayed in 1-hour units on the timer counter while the JOG/SHUTTLE button on the lower control panel is pressed. However, it is displayed in 1-hour units on the monitor screen without pressing the JOG/SHUTTLE button.
H03	TAPE RUNNING HOURS	No selection item		The accumulated tape running hours in the PLAY and SEARCH modes (except STILL mode) are displayed on the timer counter in 10-hour units. (NOTE) The accumulated tape running hours are displayed in 1-hour units on the timer counter while the JOG/SHUTTLE button on the lower control panel is pressed. However, it is displayed in 1-hour units on the monitor screen without pressing the JOG/SHUTTLE button.
H04	THREADING COUNTER	No selection item		The accumulated numbers of threading/unthreading cycle are displayed on timer counter in 10-cycle units. (NOTE) The accumulated numbers of the threading/unthreading cycle are displayed in the actual number of cycles on the timer counter while the JOG/SHUTTLE button on the lower control panel is pressed. However it is displayed in the actual number of cycles on the monitor screen without pressing the JOG/SHUTTLE button.
H12	DRUM RUNNING HOURS (resettable)	No selection item		The display content is the same as that of ITEM H02. But the ITEM H12 is resettable in the maintenance mode. (Refer to Section 5 MAINTENANCE MODE.)
H13	TAPE RUNNING HOURS (resettable)	No selection item		The display content is the same as that of ITEM H03. But the ITEM H13 is resettable in the maintenance mode. (Refer to Section 5 MAINTENANCE MODE.)
H14	THREADING COUNTER (resettable)	No selection item		The display content is the same as that of ITEM H04. But ITEM H14 is resettable in the maintenance mode. (Refer to Section 5 MAINTENANCE MODE.)

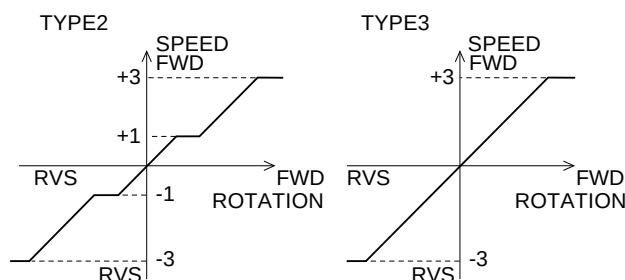
ITEM-000 SERIES: OPERATIONAL PARAMETER

ITEM No.	TITLE	DATA No.	DISPLAY	Description
002	CHARACTER H-POSITION	PAL NTSC 00 00 12 14 24 24		Select the horizontal display position of the characters such as time code superimposed on the output signal of the VIDEO OUTPUT-2 and RF ADAPTOR VIDEO connectors. Select hexadecimal "00" to position characters from the left most end of the screen. Increasing the data moves the character position to the right. The largest hexadecimal number (the right most end) is "24". (37 steps)
003	CHARACTER V-POSITION	PAL NTSC 00 00 6A 56 81 6A		Select the vertical display position of the characters such as time code superimposed on the output signal of the VIDEO OUTPUT2 and RF ADAPTOR VIDEO connectors. Select hexadecimal "00" to position characters from the top end of the screen. Increasing the data moves the character position lower. The largest hexadecimal number (the bottom end) : 6A (for NTSC) : 81 (for PAL)
005	DISPLAY INFORMATION SELECT	0 1 2 3 4 5	time data & status time data & UB time data & CTL time data & time data time data only replay indicate	Select the information to be displayed by characters that are superimposed on the output signal of the VIDEO OUTPUT 2 and RF ADAPTOR VIDEO connectors, when the system setup panel CHARACTER switch is ON. 0: Time counter display information and VTR status 1: Time counter display information and user's bits 2: Time counter display information and CTL 3: Time counter display information and time code (LTC or VITC) 4: Time code (LTC or VITC) only 5: "R" (replay) is displayed during DT playback mode.
007	TAPE TIMER DISPLAY	0 1	+/-12H 24H	Select the CTL counter display mode to be either 12-hour display or 24-hour display. 0: 12-hour display 1: 24-hour display
009	CHARACTER TYPE	0 1 2 3	white black W/out B/out	Select the type of characters such as time code that are superimposed in the VIDEO OUTPUT-2 and RF ADAPTOR VIDEO connectors. 0: White letters with black background 1: Black letters with white background 2: White letters with black outline 3: Black letters with white outline

ITEM No.	TITLE	DATA No.	DISPLAY	Description
011	CHARACTER V-SIZE	<u>01</u>	<u>×1</u>	Select the vertical size of characters such as time code that are superimposed in the VIDEO OUTPUT-2 and RF ADAPTOR VIDEO connectors. 01: Standard size 02: Twice the standard size 03: Three times the standard size 04: Four times the standard size
		02	×2	
		03	×3	
		04	×4	
012	CONDITION DISPLAY ON VIDEO MONITOR	<u>0</u>	<u>disable</u>	Select whether or not to additionally display the channel condition to the superimposing video characters. 0: Does not display the condition 1: Displays the condition How the Displayed the Channel Condition The condition is displayed below the timer or status line of the video characters. (Example) V---A--- The four characters following "V" display each video channel condition between Ach and Dch of the rotary head. The four characters following "A" display each audio channel condition between Ach and Dch of the rotary head. Character pattern (Space): Status in which no condition is displayed on the front panel.(STBY OFF, etc.) -: The condition is good. (The front panel display corresponds to green.) *: The condition is no so good. (The front panel display corresponds to yellow.) ■: The condition is bad. (The front panel display corresponds to red.)
		1	enable	

ITEM-100 SERIES: OPERATIONAL PANEL PARAMETER

ITEM No.	TITLE	DATA No.	DISPLAY	Description
101	SELECTION FOR SEARCH DIAL ENABLE	<u>0</u>	<u>dial direct</u>	Select how the unit enters the search mode. 0: The unit enters the search mode by turning the search dial in all modes. 1: The unit enters the search mode by pressing search button.
		1	via search key	
116	JOG DIAL RESPONSE	<u>0</u>	<u>type 1: -1 to +1</u>	Select the tape speed (VTR command) characteristics which correspond to the JOG dial rotation. 0: Tape speed changes with linear characteristics in the range from -1 to +1 times normal tape speed. 1: Tape speed changes with flight of steps characteristics in the range from -3 to +3 times normal tape speed as shown in the TYPE 2. (This characteristics has the flat response where tape speed does not change regardless the JOG dial rotation in the range of ± 1 times normal tape speed.) 2: Tape speed changes with linear characteristics in the range from -3 to +3 times normal tape speed as shown in the TYPE 3.
		1	type 2: -3 to +3	
		2	type 3: -3 to +3	



ITEM-700 SERIES: VIDEO CONTROL PARAMETER (for NTSC)

ITEM No.	TITLE	DATA No.	DISPLAY	Description	
713	VIDEO SETUP REFERENCE LEVEL			This item sets the amount of the video setup that is added to the composite output signal. When the “MASTER” is selected to the ITEM OUTPUT LEVEL, the amount of setup (in the range from 0.0% to 10.0%) is selected by the ITEM MASTER LEVEL that is added to the composite output signal.	
	SUB ITEM				
	0	MASTER LEVEL	1 0 15		0.0% 7.5% 10.0% (0.5% steps)
	1	INPUT LEVEL*	_____		_____
	2	VBLK REMOVE CNT*	0 1		REMOVE throu
	3	BETACAM PB LEVEL*	_____		_____
	4	OUTPUT LEVEL	0 1 15		MASTER 0.0% 10.0% (0.5% steps)

* These SUB-ITEMs are displayd on the screen, but cannot be selected.

ITEM-F00 SERIES : ADJUSTMENT USE ONLY

The item below are not displayed on the normal operation to avoid the erroneous operation.

To display the items below in the setup menu, perform the following preparation and operation.

Preparation

Modify the setting in the customize menu mode.
(Refer to Operation Manual.)

Operation

To display the items below in the setup menu, turn the search dial while pressing the PLAY button on the lower control panel.

CAUTION

The items below are used exclusively for adjustment. After adjustment is completed, the menu data should be returned to the factory setting.

ITEM No.	TITLE	DATA No.	DISPLAY	Description
F13	TRACKING CONTROL VIA SEARCH DIAL	0 1	off on	Select whether the tracking control operation with search dial is enabled or not during DT head playback. This item is prepared exclusively for DT adjustment and tracking adjustments. After adjustment is completed, return to the factory setting '0 (off)'. 0: Tracking control function is disabled during DT head playback. 1: Tracking control function is enabled by rotating the search dial during PLAY mode.

1-11-3. Setting Check Sheet**SETUP MENU****ITEM-H00 SERIES: HOURS METER PARAMETER**

ITEM	Factory Setting	Bank 1	Bank 2	Bank 3
H01: OPERATION HOURS	_____			
H02: DRUM RUNNING HOURS	_____			
H03: TAPE RUNNING HOURS	_____			
H04: THREADING COUNTER	_____			
H12: DRUM RUNNING HOURS (resettable)	_____			
H13: TAPE RUNNING HOURS (resettable)	_____			
H14: THREADING COUNTER (resettable)	_____			

ITEM-000 SERIES: OPERATIONAL PARAMETER

ITEM	Factory Setting	Bank 1	Bank 2	Bank 3
002: CHARACTER H-POSITION	14 (for NTSC) 12 (for PAL)			
003: CHARACTER V-POSITION	56 (for NTSC) 6A (for PAL)			
005: DISPLAY INFORMATION SELECT	0			
007: TAPE TIMER DISPLAY	0			
009: CHARACTER TYPE	0			
011: CHARACTER V-SIZE	01			
012: CONDITION DISPLAY ON VIDEO MONITOR	0			

ITEM-100 SERIES: OPERATIONAL PANEL PARAMETER

ITEM	Factory Setting	Bank 1	Bank 2	Bank 3
101: SELECTION FOR SEARCH DIAL ENABLE	0			
116: JOG DIAL RESPONSE	0			

ITEM-700 SERIES: VIDEO CONTROL PARAMETER (for NTSC)

ITEM	Factory Setting	Bank 1	Bank 2	Bank 3
713: VIDEO SETUP REFERENCE LEVEL				
SUB-ITEM				
0: MASTER LEVEL	10			
4: OUTPUT LEVEL	0			

SWITCH AND SHORTING LAND ON BOARD

Board	Switch/Shorting Land	Factory Setting	Setting
APR-1	Output Level	MONITOR L CH	+4 dBm (600 Ω)
		MONITOR R CH	+4 dBm (600 Ω)
	Output Headroom	MONITOR L CH	-20 dB
		MONITOR R CH	-20 dB
	MONITOR Output Level	MONITOR L CH	Fixed
		MONITOR R CH	Fixed
SS-52	S100-1: SETUP MENU MODE	OFF(OPEN)	
	S100-2: Factory use	OFF(OPEN)	_____
	S100-3: Factory use	OFF(OPEN)	_____
	S100-4: Factory use	OFF(OPEN)	_____
	S100-5: CUSTOMIZE MENU MODE ENABLE	OFF(OPEN)	
	S100-6: Factory use	OFF(OPEN)	_____
	S100-7: MAINTENANCE MODE ACCESS ENABLE	OFF(OPEN)	
	S100-8: Factory use	OFF(OPEN)	_____
	S701-1: TRCON VR DISABLE	ON(CLOSE)	
	S701-2 to 8: Factory use	OFF(OPEN)	_____

Section 2

Service Overview

2-1. Notes on Power Supply Block

2-1-1. Warning on Primary Circuit and Electric Shock

The power supply block consists of the AC-139 board and primary peripheral components. The whole AC-139 board is on the primary side circuit, so pay careful attention to the electric shock. Since the inside of a switching regulator is also on the primary side circuit, treat it with care.

2-1-2. Notes on Resetting the Circuit Breaker

When the breaker on the power supply panel is activated and the button is ejected, remove the cause of the trouble, then push the button.

2-2. Removal/Installation of Cabinet

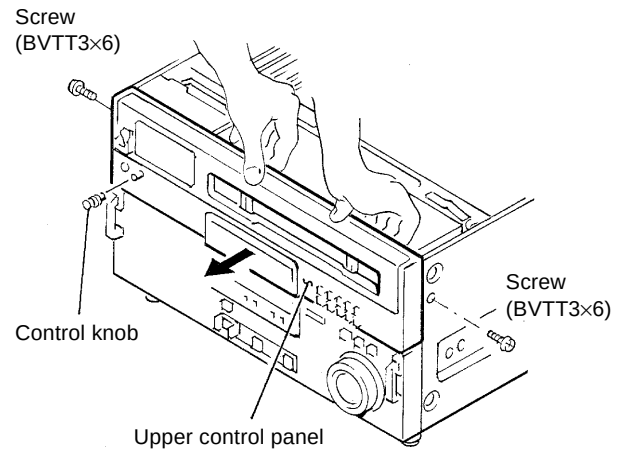
2-2-1. Cabinet Removal/Installation

CAUTION

Always switch off the POWER before removing and installing cabinet.

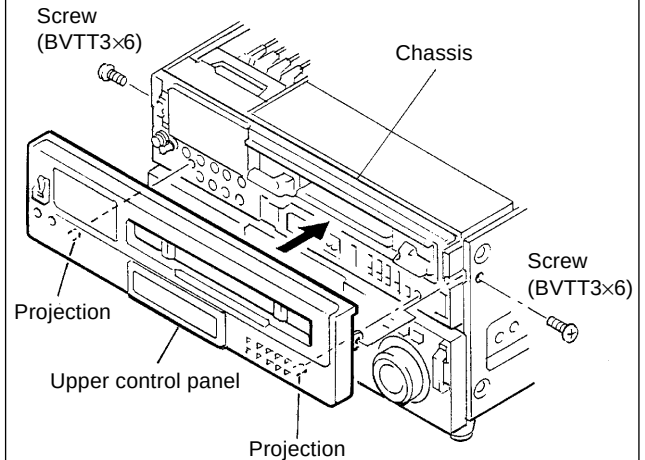
Upper Control Panel

1. Remove the upper lid.
2. Remove the control knob on the upper control panel.
3. Remove the each one screw on the left and right sides.
4. Fingers should be inserted in the space between the upper control panel and chassis, and remove the upper control panel as shown in the figure A.

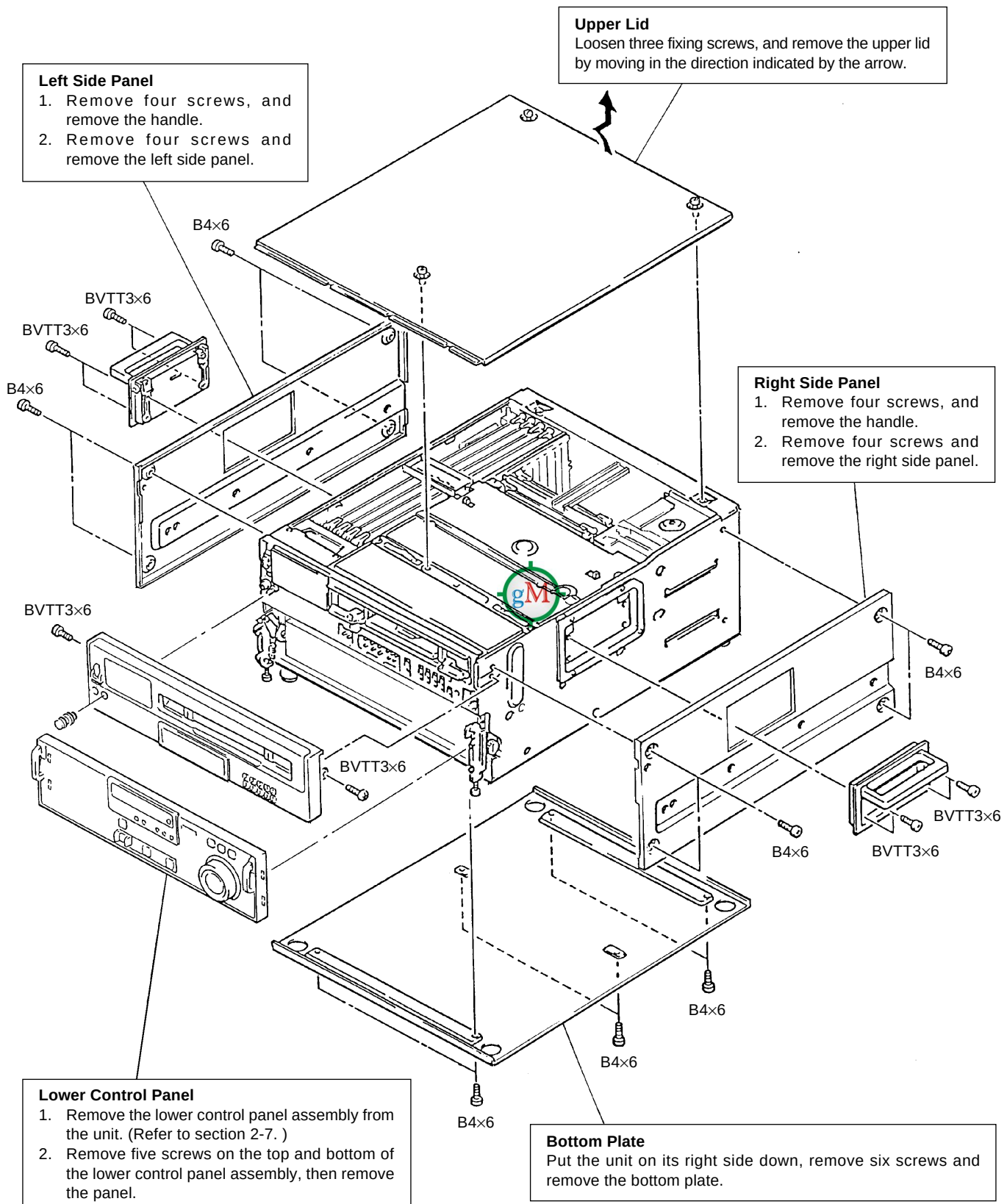


<Fig. A>

5. When installing, insert the projections of the upper control panel into the holes of the chassis, then fix the panel with the screws as shown in the figure B.



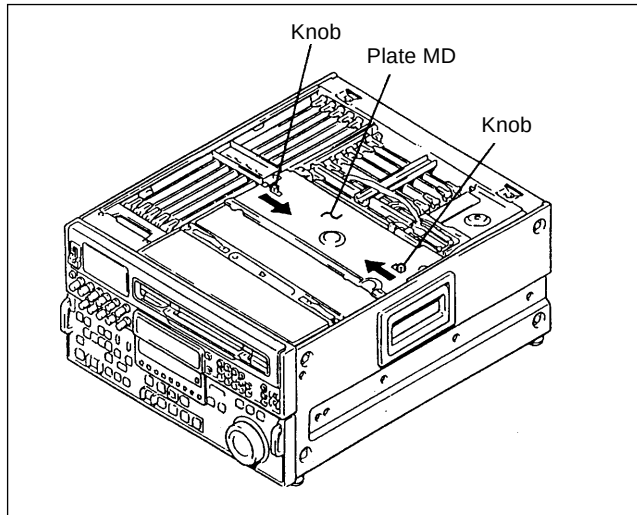
<Fig. B>



2-2-2. Removal/Installation of Plate MD

Removal

1. Remove the upper lid. (Refer to Section 2-2-1.)
2. Slide the knobs of the plate MD each in the direction indicated by the arrows (inside).



Sliding of the Knob Positions

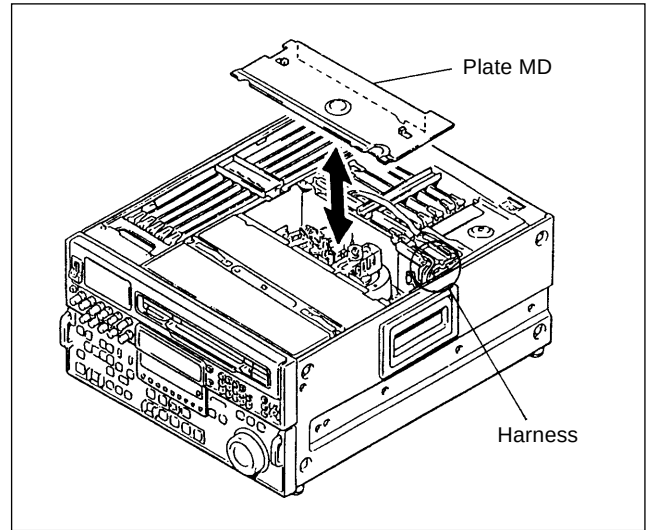
3. Remove the plate MD.

Installation

4. Insert the plate MD into the clearance shown in the figure.

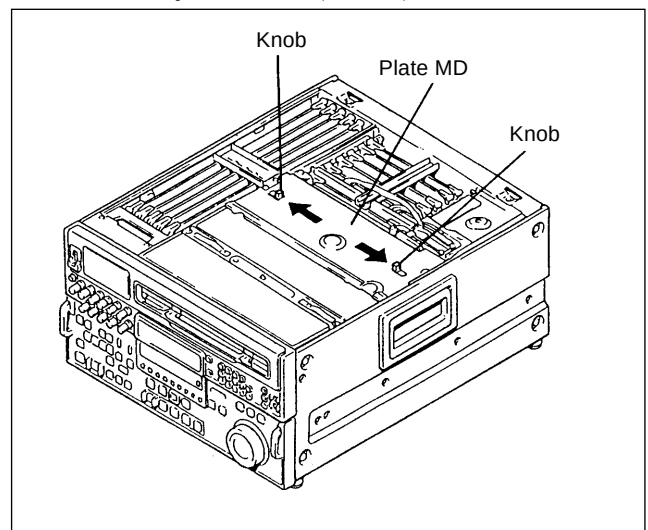
Note

Be careful not to put the harness under the plate MD in this case.



Removal/Installation of Plate MD

5. Slide the knobs of the plate MD each in the direction indicated by the arrows (outside), then fix.

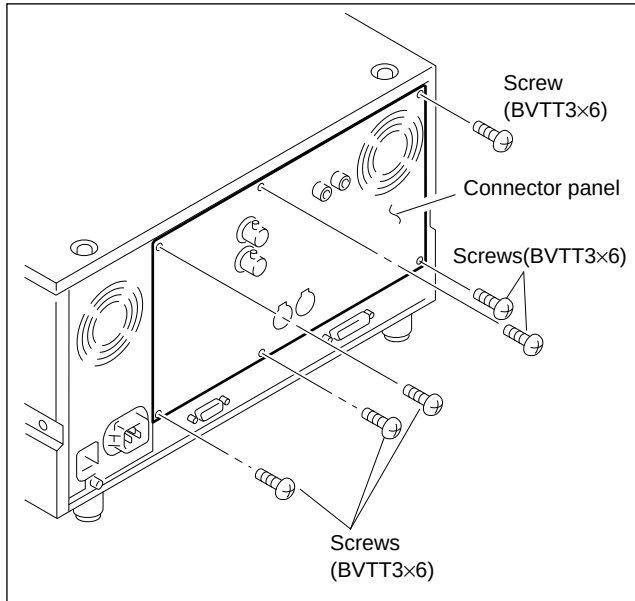


Fixing of the Plate MD

6. Install the upper lid.

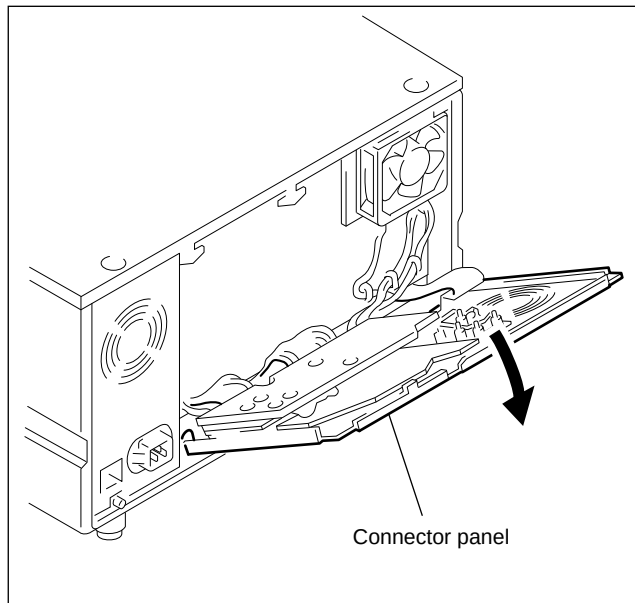
2-2-3. Connector Panel Removal/Installation

1. Turn off the POWER.
2. Remove six screws indicated → at the top and bottom on the connector panel.



Removal of Screws

3. Remove the connector panel so as not to stretch the harness as shown in the figure.

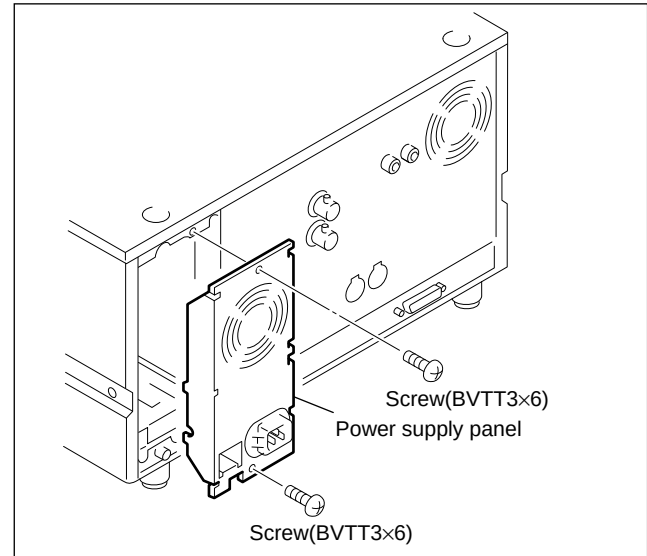


Removal of the Connector Panel

4. Install the connector panel in the reverse order of steps 1 through 3.

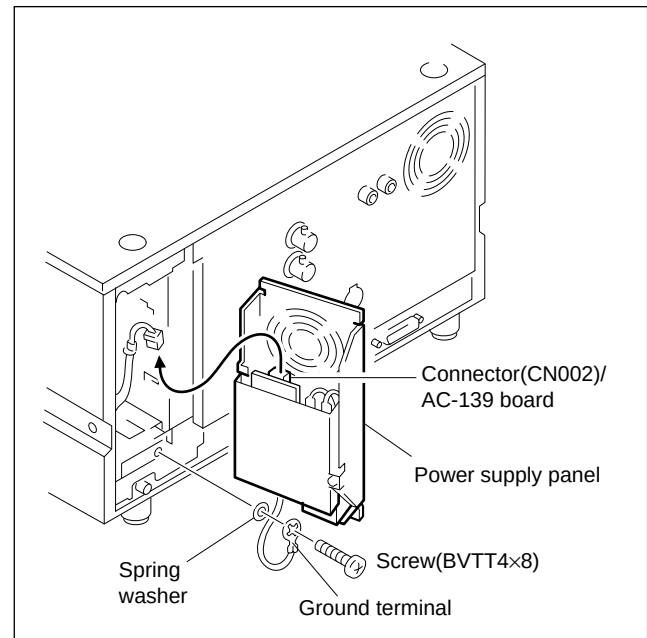
2-2-4. Power Supply Panel Removal/Installation

1. Turn off the POWER.
2. Remove two screws, and open the power supply panel.



Removal of the Power Supply Panel

3. Remove a screw and a spring washer which secure the ground terminal, then disconnect connector (CN002) on the AC-139 board, then remove the power supply panel.



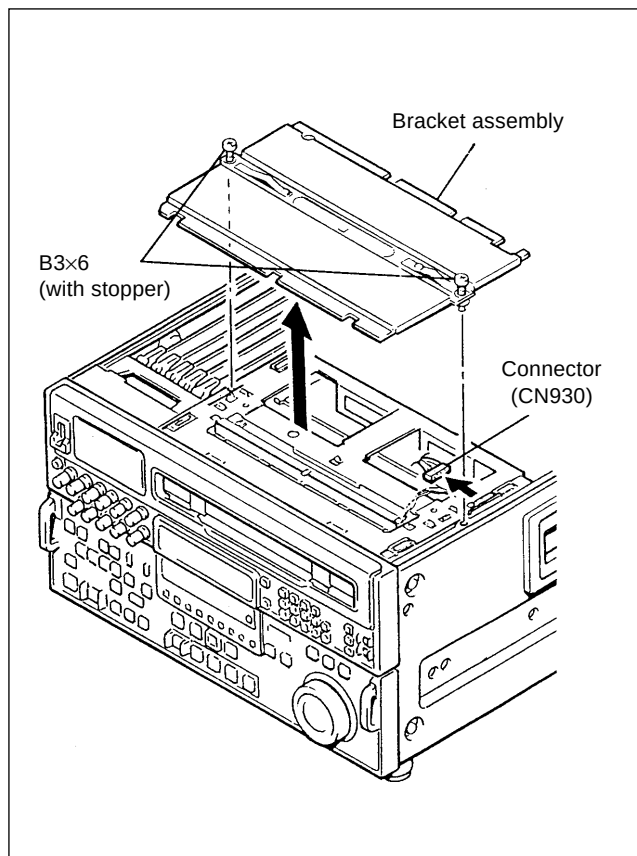
Disconnecting the Connector

4. Install the power supply panel in the reverse order of steps 1 through 3.

2-3. Cassette Compartment Removal/Installation

Removal

1. Press the EJECT button with the power on.
2. Turn off the POWER.
3. Remove the upper lid.
(Refer to Section 2-2-1.)
4. Remove the plate MD assembly.
(Refer to Section 2-2-2.)
5. Loosen two screws, and remove the cassette compartment bracket assembly.
6. Disconnect the connector (CN930) on the CL-29 board.

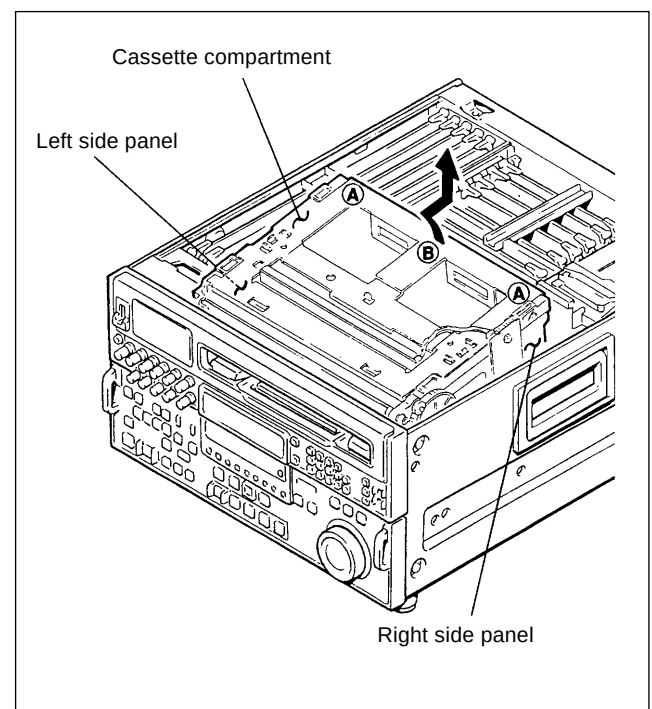


Removal of the Bracket Assembly

7. Remove the four legs of the cassette compartment for fixing the position by lifting the cassette compartment slightly and straight with (A) portions (two portions) held.
8. Remove the cassette compartment by sliding up it raising up the rear part with the (B) portion held as shown in the figure.

Note

In this time, do not move the cassette compartment to right and left and do not widen the right and left side panels. If the right and left side panels are widened, a gear position might be changed or some parts might be removed.



Removal of the Cassette Compartment

9. When putting the removed cassette compartment outside of the unit, make the four legs for fixing position faced down.
(Because the flexible card wire might be get damaged if the cassette lid is faced down.)

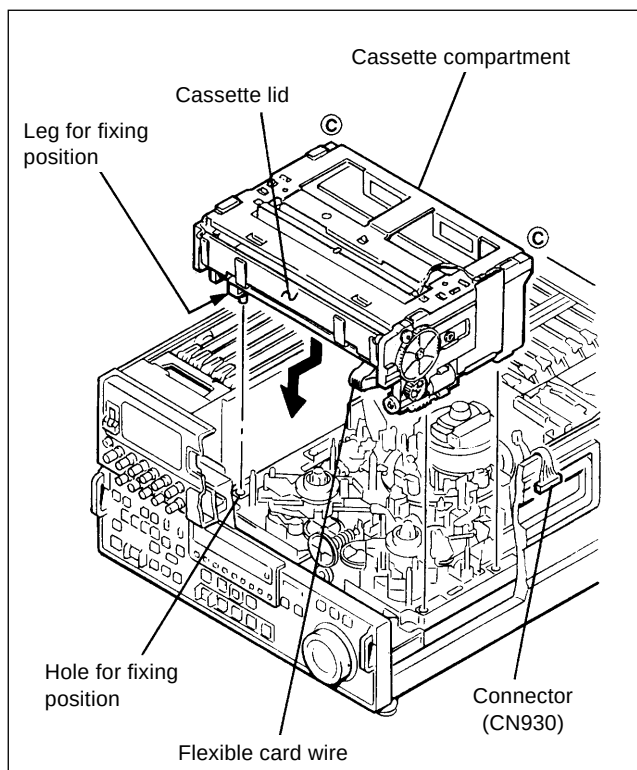
Installation

10. Set the harness of the connector (CN930) disconnected in step 6 so it is not put between chassis.
11. Install the cassette compartment inserting slantingly in the direction as shown in the figure.
12. Insert the four legs of the cassette compartment for fixing the position into the four holes of the mechanical chassis for fixing the position by pressing the © portions (two portions) as shown in the figure.
13. After confirming that the cassette compartment is fixed to the chassis, install the cassette compartment bracket assembly.

Note

When looked down on from the top, check that the two leaf springs are pressed by the two projections on the cassette compartment.

14. Connect the connector (CN930) on the CL-29 board.



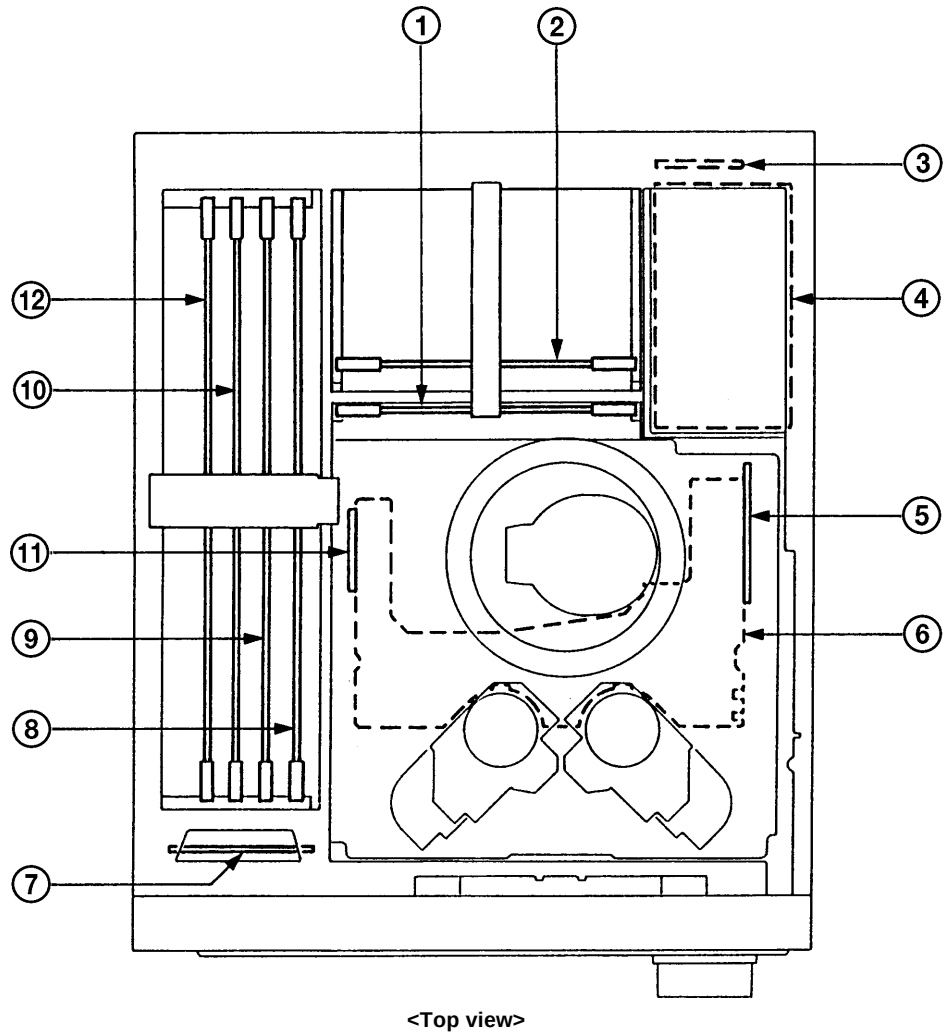
Installation of the Cassette Compartment

2-4. Locations of Main Part

2-4-1. Printed Circuit Board Locations

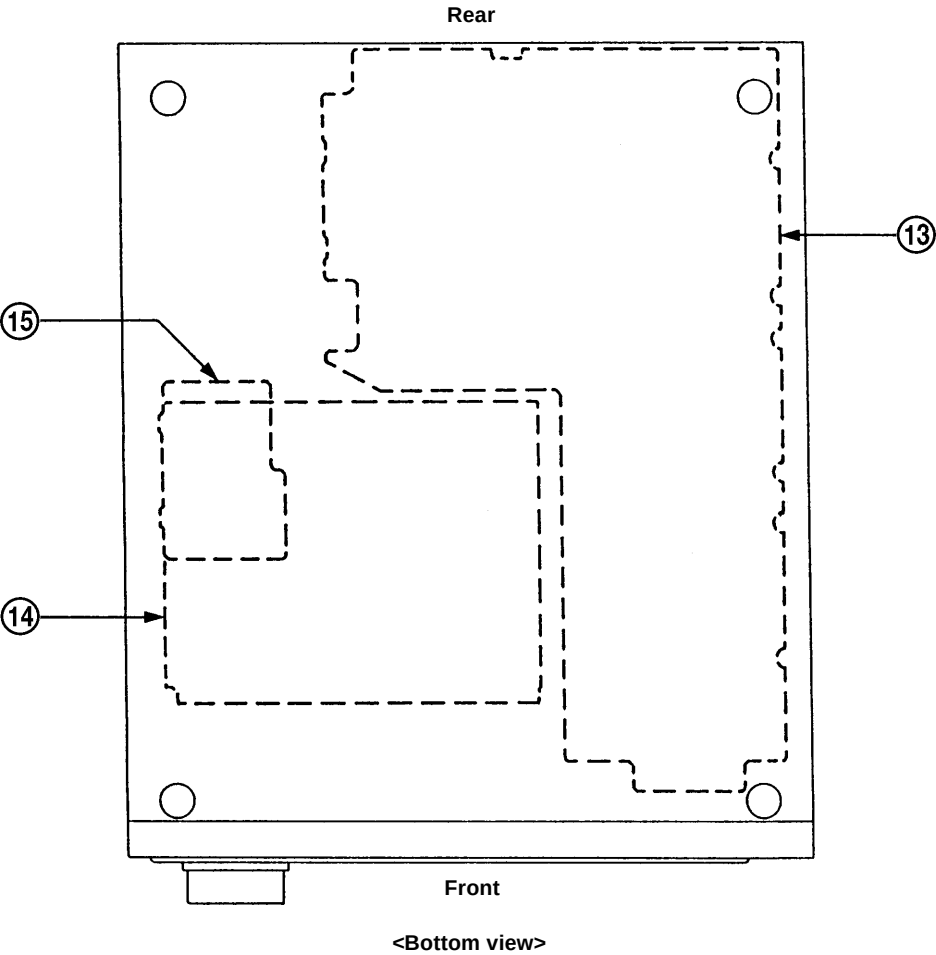
INDEX

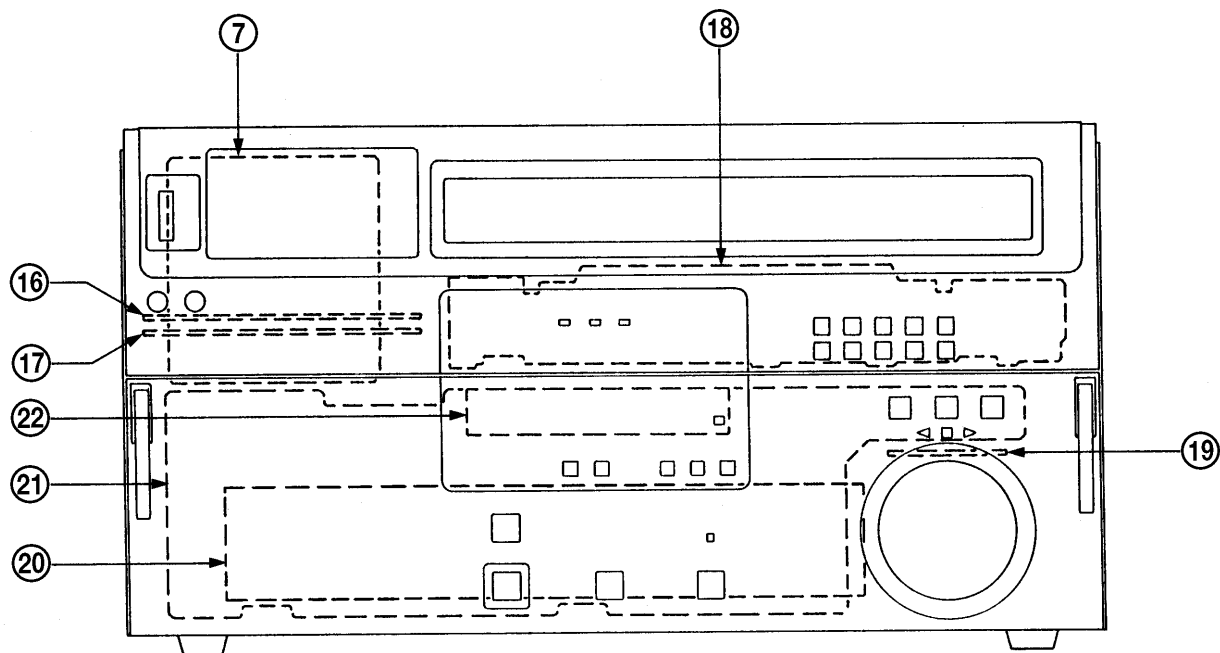
AC-139	③
APR-1	⑨
CCM-15	②⑦
CL-29	③⑤
CP-279	②⑤
CP-280	②④
CP-282	②③
CUE-1	②
DP-176	②②
DPR-36	⑩
DR-200	⑭
DT-34	⑮
EQ-45	①
FP-58	⑦
HN-181	⑥
HN-184	⑪
HN-185	⑤
KY-231	②①
MB-441	⑬
PC-70	③⑥
PD-35	③④
PTC-54	②⑥
PTC-59	②⑨
PTC-69	①⑨
PTC-71	③②
RM-82	③①
SE-228	③⑩
SS-52	⑧
SW REG	④
SWC-17	①⑧
SWC-19	②⑩
TR-78	③③
TR-79	②⑧
VPR-1	①②
VR-152	①⑥
VR-207	①⑦



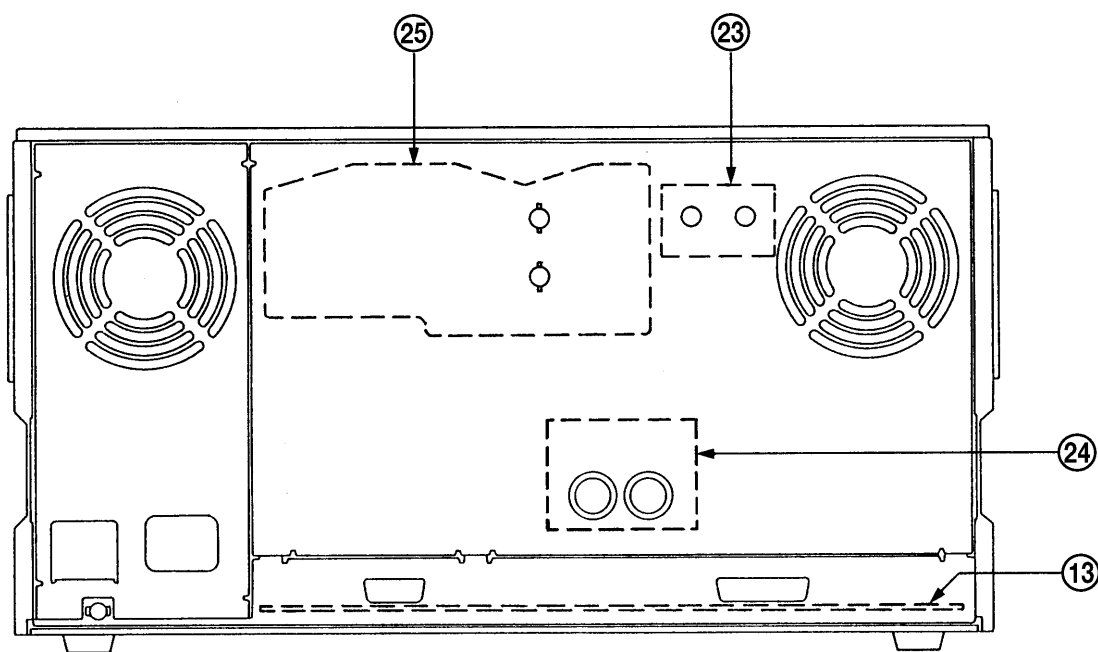
INDEX

AC-139	③
APR-1	⑨
CCM-15	②⑦
CL-29	③⑤
CP-279	②⑤
CP-280	②④
CP-282	②③
CUE-1	②
DP-176	②②
DPR-36	⑩
DR-200	⑭
DT-34	⑮
EQ-45	①
FP-58	⑦
HN-181	⑥
HN-184	⑪
HN-185	⑤
KY-231	②①
MB-441	⑬
PC-70	③⑥
PD-35	③④
PTC-54	②⑥
PTC-59	②⑨
PTC-69	①⑨
PTC-71	③②
RM-82	③①
SE-228	③⑩
SS-52	⑧
SW REG	④
SWC-17	①⑧
SWC-19	②⑩
TR-78	③③
TR-79	②⑧
VPR-1	①②
VR-152	①⑥
VR-207	①⑦

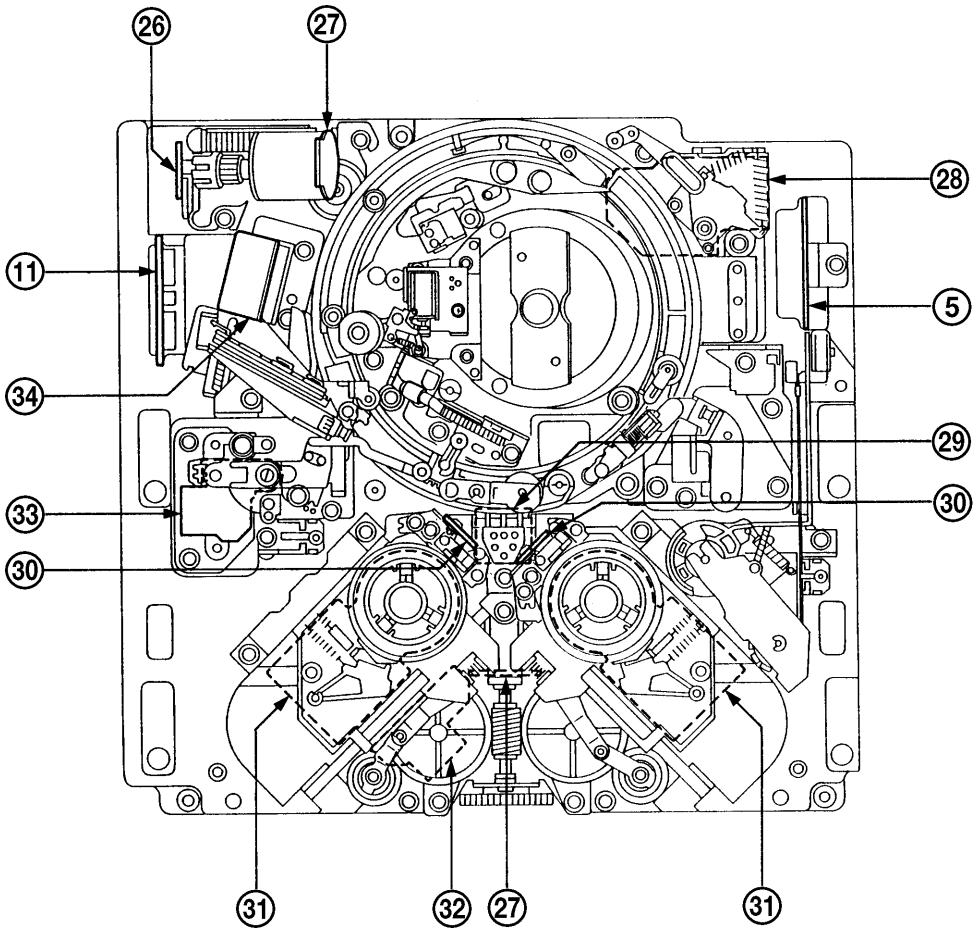




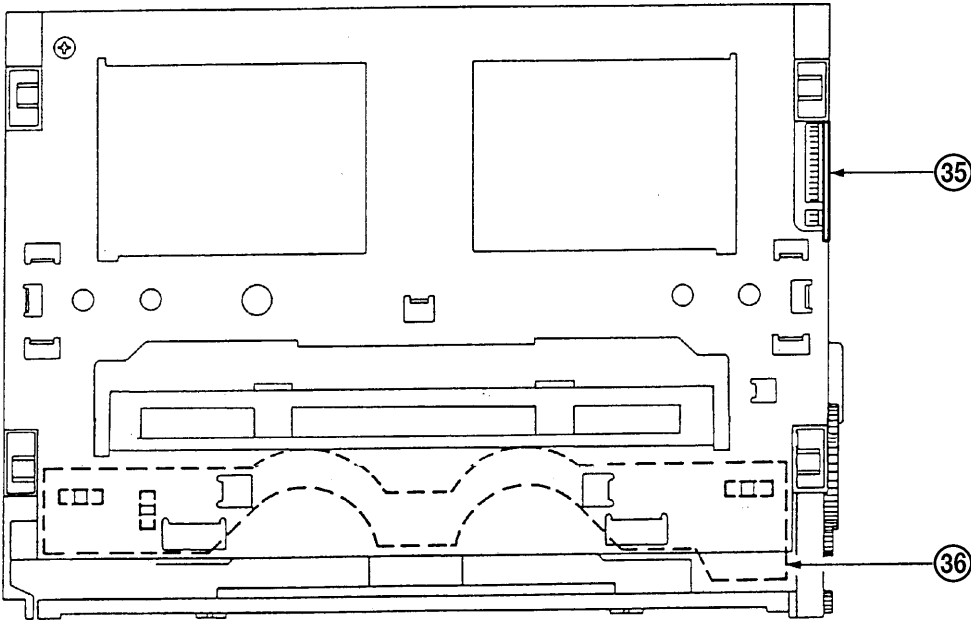
<Front view>



<Rear view>

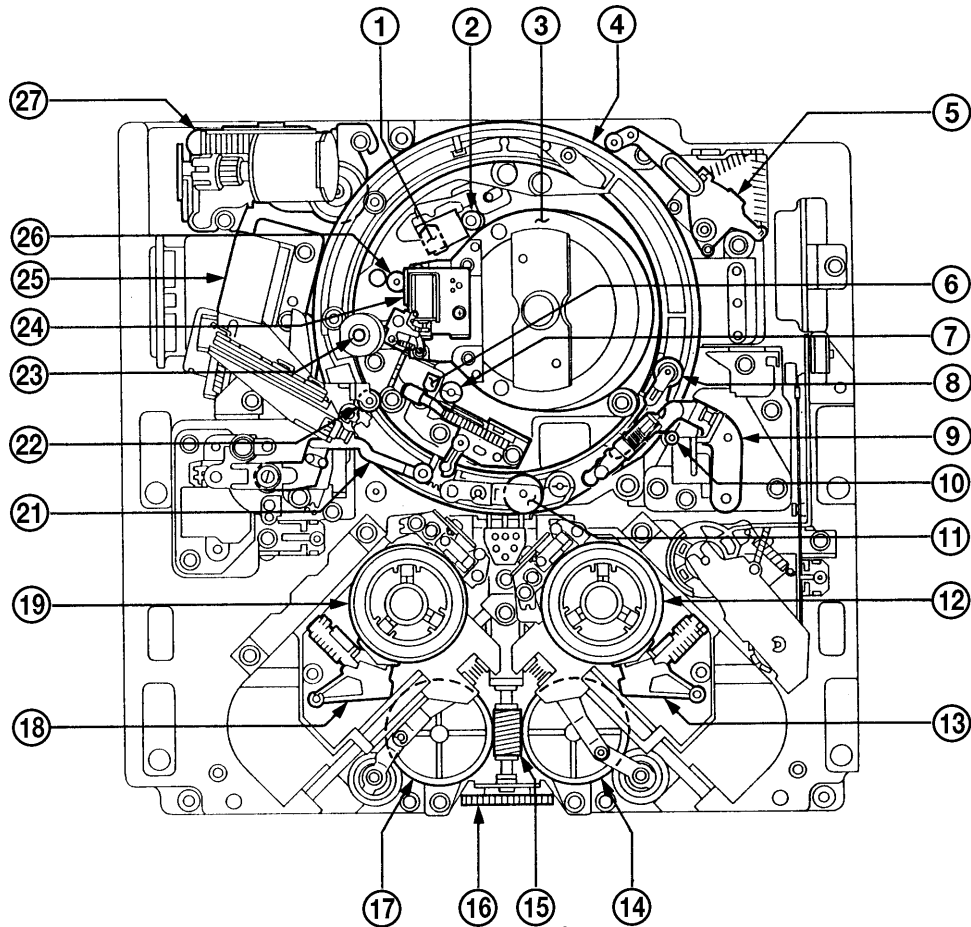


<Top view>



<Top view of cassette compartment>

2-4-2. Main Mechanical Part Locations

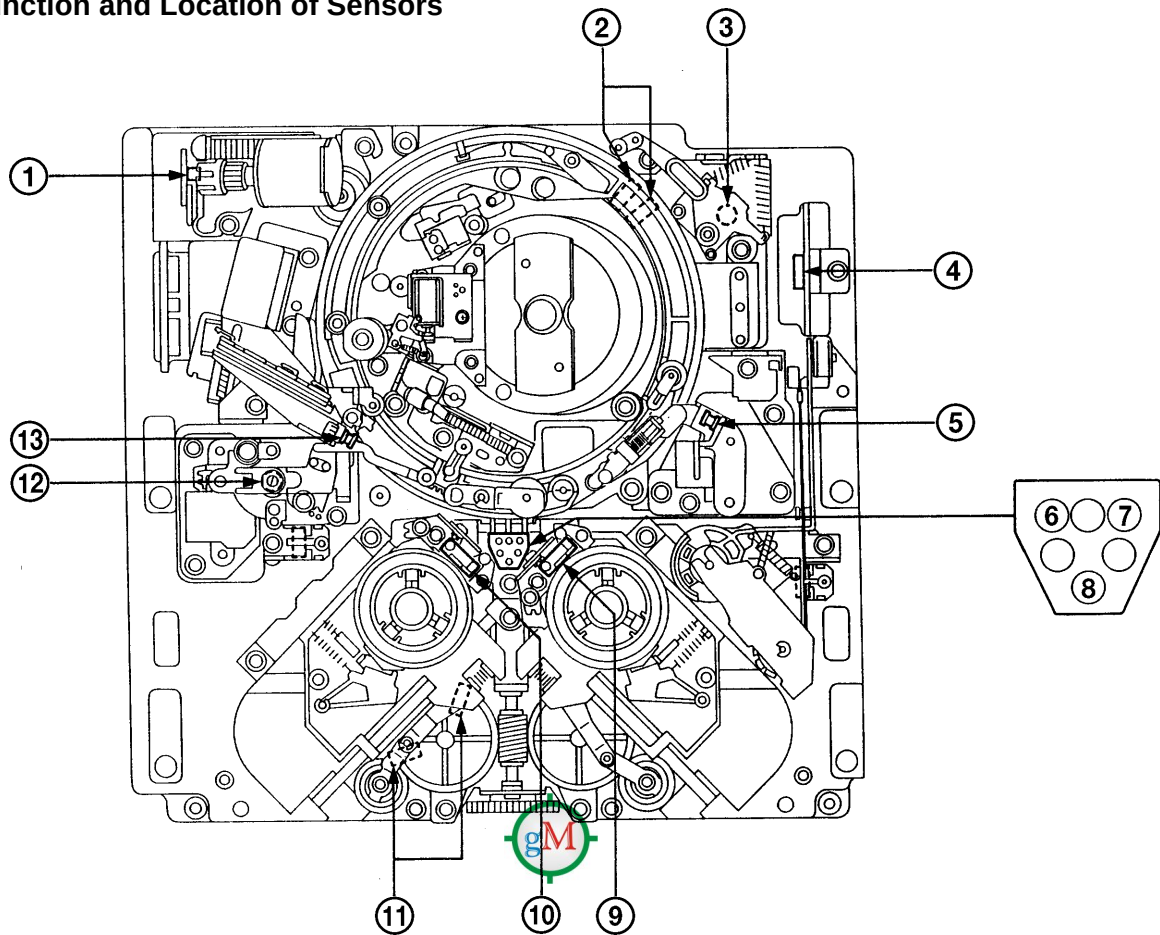


<Top view>

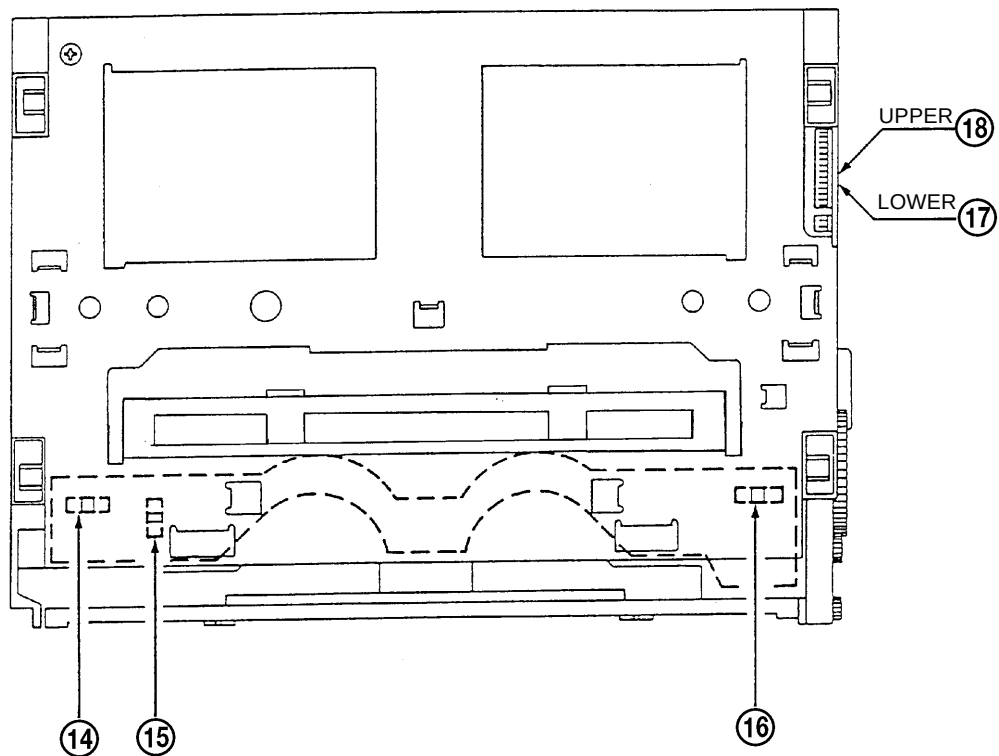
INDEX

- | | |
|---------------------------|---------------------------|
| ① Audio/TC head | ⑭ T worm wheel |
| ② TG-3 tape guide | ⑮ Worm gear |
| ③ Head drum | ⑯ Drive gear |
| ④ Threading ring | ⑰ S worm wheel |
| ⑤ T tension regulator arm | ⑱ S brake assembly |
| ⑥ CTL head | ⑲ S reel table |
| ⑦ TG-2 tape guide | ⑳ S tension regulator arm |
| ⑧ Audio/TC head cleaner | ㉑ TG-0 tape guide |
| ⑨ T drawer arm | ㉒ Capstan shaft |
| ⑩ TG-10 tape guide | ㉓ Cleaning roller block |
| ⑪ Pinch roller | ㉔ Pinch press block |
| ⑫ T reel table | ㉕ TG-4 tape guide |
| ⑬ T brake assembly | ㉖ Threading gear block |

2-4-3. Function and Location of Sensors



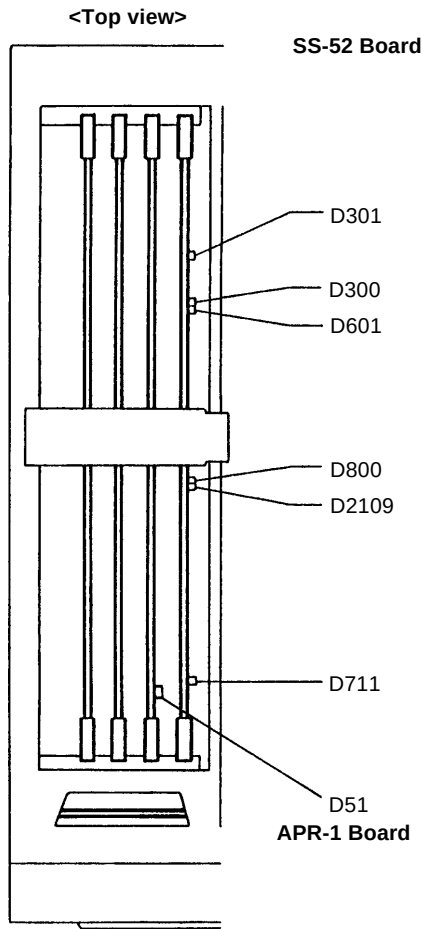
<Top view>



<Top view of cassette compartment>

- ① **Threading motor rotation sensor**
The threading motor rotation sensor detects the rotation speed of the threading motor.
The FG output signal of this detection sensor is input to the servo circuit to control the threading speed so that the tape is not damaged during threading and unthreading.
- ② **Threading-end/unthreading-end sensor**
This sensor detects whether the threading ring reaches the threading-end or unthreading-end position.
- ③ **T tension regulator arm sensor**
During playback, this sensor detects the tension arm position and controls the reel torque to keep a constant T tape tension.
- ④ **Condensation sensor**
This sensor detects whether the dew condensation occurs in the unit.
- ⑤ **Tape top sensor**
This sensor detects the top of the tape, and in addition detects the tape end of the tape that runs in the reverse direction.
- ⑥ **Reel hub diameter sensor**
The reel hub diameter of a cassette tape varies depending on the length of the tape wound on the cassette tape. The reel hub diameter sensor detects the reel hub diameter using a tub on the back side of the cassette tape. The output signal of this sensor is input to the servo circuit to control the rotation speed and torque of the reel motor.
- ⑦ **Tape thickness sensor**
Using a tub on the back side of the cassette tape, this sensor detects the thickness of the tape wound on a cassette tape that is being inserted into the unit.
- ⑧ **Analog/digital tape sensor**
Using a tub on the back side of the cassette tape, this sensor detects whether an analog tape or digital tape is being inserted into the unit.
- ⑨ **T reel table rotation sensor**
This sensor detects the rotation of the take-up reel table.
The FG output signal of this sensor is input to the servo circuit to control the rotation speed of the reel motor.
- ⑩ **S reel table rotation sensor**
This sensor detects the rotation of the supply reel table.
The FG output signal of this sensor is input to the servo circuit to control the rotation speed of the reel motor.
- ⑪ **Reel L/S position sensor**
This sensor detects whether the reel table moves to the correct position according to the size of the inserted cassette tape.
- ⑫ **S tension regulator arm sensor**
During playback, this sensor detects the tension arm position and controls the reel torque to keep a constant S tape tension.
- ⑬ **Tape end sensor**
This sensor detects the end of the tape that runs in the forward direction.
- ⑭ **Cassette-in sensor (L)**
This sensor detects whether a cassette is being inserted.
- ⑮ **Cassette L/S size sensor**
This sensor detects whether the inserted cassette tape is an L size or S size.
- ⑯ **Cassette-in sensor (R)**
This sensor detects whether a cassette is being inserted.
- ⑰ **Cassette-down (2) sensor**
- ⑱ **Cassette-down (1) sensor**
The cassette-down (1) sensor detects the movement of the cassette compartment through combined ON/OFF operation of the cassette-down (2) sensor, the cassette-down (1) sensor, and a cassette-in sensor.

2-5. LED Indicator Information on Boards



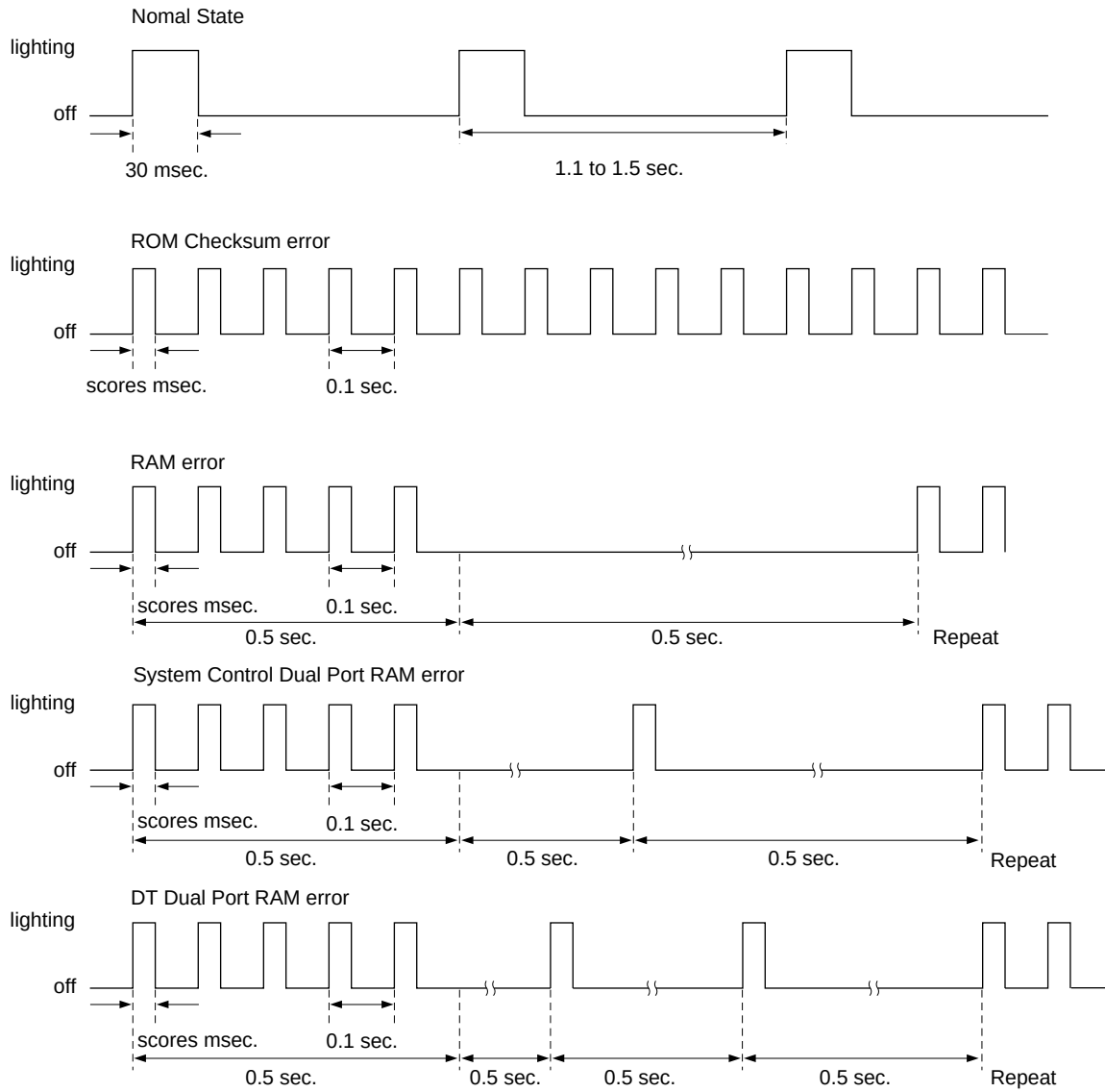
SS-52 Board

LED No.	Name	Color	Description	Normal State
D300	———	———	Unused	———
D301	SYS 1	Amber	Blinks during SYS 1 V25 CPU normal operation.	Blinks
D601	SYS 2	Amber	Blinks during SYS 2 Z80 CPU normal operation.	Blinks
D711	SV	Amber	Checks the ROM and RAM for communication when the power switch is set to ON. Lights for scores ms at intervals 1 to 2 seconds. (For the blinking pattern when abnormality occurred, refer to the figure shown next page.)	Blinks
D800	DRUM	Amber	Blinks during drum microcomputer normal operation. Usually lights for 30 msecond at intervals of about one second. The blinking interval is inverted when the drum is locked.	Blinks
D2109	DT	Amber	Blinks during DT microcomputer FMC-16 CPU normal operation.	Blinks

APR-1 Board

LED No.	Name	Color	Description	Normal State
D51	APR 1	Amber	Blinks during APR 1 microcomputer normal operation (when a 1/2VD signal is received from the SS-52 board).	Blinks

<Blinking Pattern of D711 on SS-52 Board>

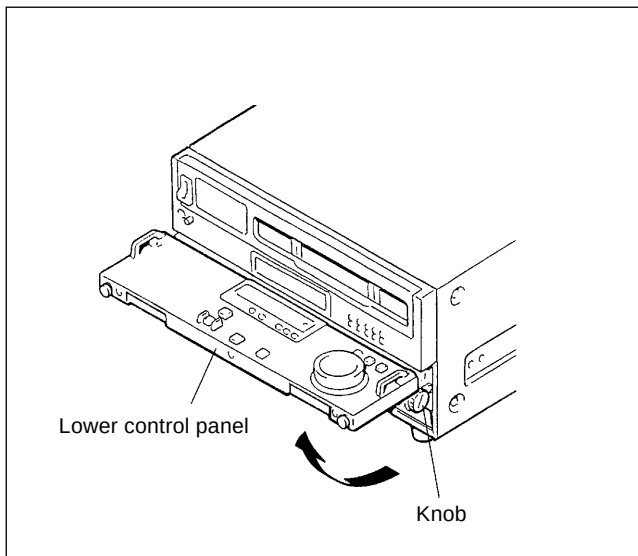


2-6. How to Pull out/Push in the Lower Control Panel

Lift the lower control panel. The panel can be moves maximum 90 degrees.

Note

The lower control panel can be tilted up to 90 degrees by approximately 15 degree step. When using the lower control panel on the tilt, turn the knobs clockwise to hold the panel firmly.



Pulling out/Pushing in the Lower Control Panel

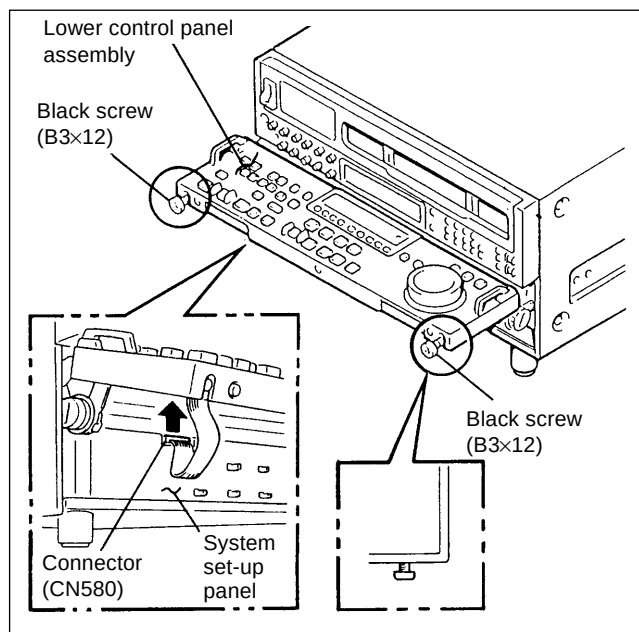
Note

Put back the panel assembly in the unit surely after using the unit.

2-7. Removal/Installation of Lower Control Panel Assembly

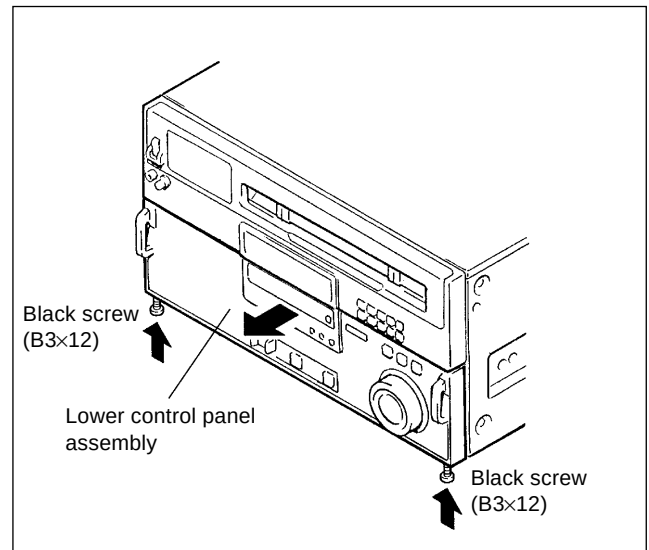
Removal

1. Fix a lower control panel assembly at 90 degrees.
(Refer to Section 2-6.)
2. Disconnect the connector (CN580) on the system set-up panel.
3. Loosen the two black screws on the lower control panel assembly. (Loosen the screws until screw's top are exposed from the lack of the lower control panel assembly.)



Disconnecting the Connector

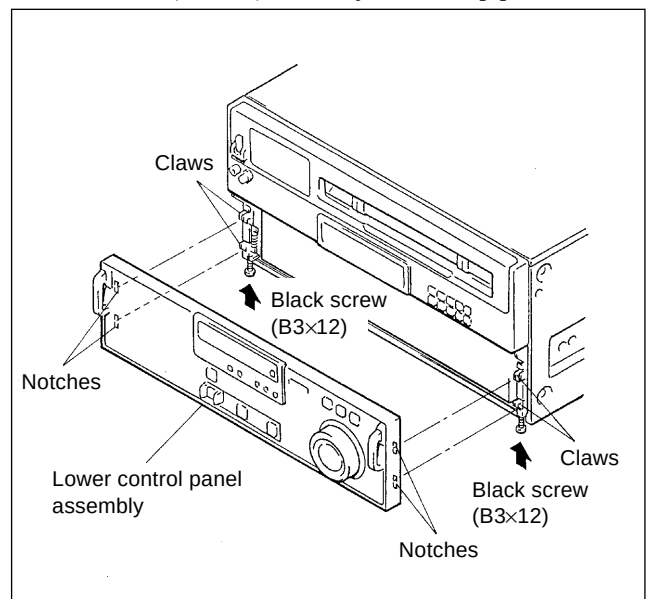
4. Close the lower control panel assembly.
5. While pushing the loosen black screws in the direction of the arrow, remove the lower control panel assembly in the direction of the arrow from the arms.



Removal of the Panel Assembly

Installation

6. Fix the arms at the normal position.
7. While pushing the black screws and set the notches of the panel assembly to the claws of the arms. Then leave from the black screws.
8. Fix the lower control panel assembly at 90 degrees. Then fix the panel assembly with the two screws.
9. Connect the harness of the panel assembly to the connector (CN580) on the system set-up panel.



Installation of the Panel Assembly

2-8. How to Take out the Cassette when the Tape is Slacking

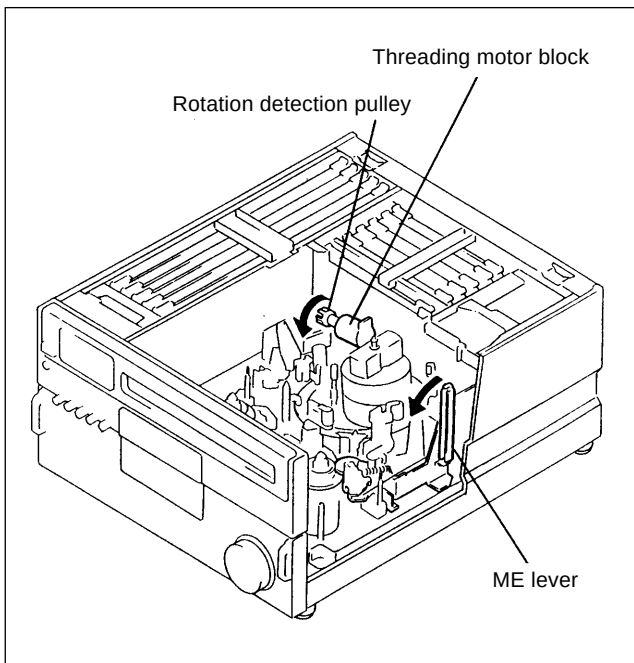
When the tape is slacked in the VTR, take out the cassette tape in the procedure below while taking care not to damage the tape.

1. Turn off the POWER.
2. Remove the upper lid.
(Refer to Section 2-2-1.)
3. Remove the plate MD.
(Refer to Section 2-2-3.)
4. Rotate the rotation detection pulley of the threading motor block in the direction of the arrow with fingers by about a half turn and slacken the tape.
5. Shift the ME lever toward the front panel and wind the tape inside the cassette.

Note

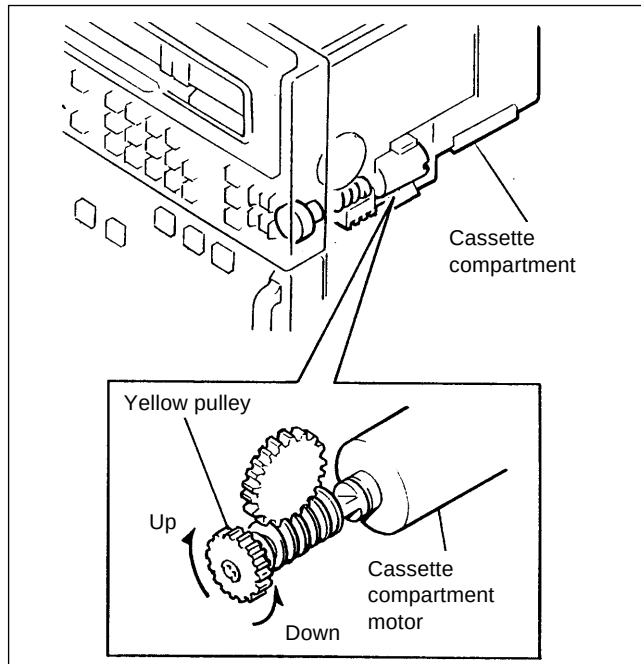
Do not shift the ME lever during normal operation (during reel table operation).

Repeat steps 4 and 5 until the unit is put into the unthreading-end state and until the tape is wound completely.



Winding of a Tape

7. Turn the yellow pulley of the cassette compartment motor shown in the figure clockwise until the cassette tape is ejected completely.



Ejection of a Cassette Tape

6. Fix the lower control panel assembly at the position of 90 degrees.
(Refer to Section 2-6.)

2-9. Cleaning when the Heads are Clogged

If the video heads are clogged, clean the heads as the following procedure.

If the video heads are clogged after cleaning by cleaning tape, clean them by cleaning piece.

2-9-1. Cleaning by Cleaning Tape

Note

Make sure to use the cleaning tape BCT-5CLN or BCT-D12CL. If the cleaning is performed by other cleaning tape, not the BCT-5CLN or BCT-D12CL, unusual friction or damage of the video head may occur.

1. Insert the cleaning tape in the unit.
2. Press the EJECT button simultaneously with PLAY button.
Head cleaning starts.
3. After 5 seconds, the cleaning tape will be ejected automatically.

Note

Be sure to eject the cleaning tape after cleaning to avoid damages to the heads.

4. Confirm that the head clog is clear.

2-9-2. Cleaning by Cleaning Cloth

Caution

- Turn the power off before cleaning.
- Each block in the mechanical deck consists of a precision part and is adjusted precisely. Be careful not to damage each part and to apply an excessive force during cleaning.
- Do not touch the greased portions during cleaning. If grease attaches to a cleaning cloth, replace the cleaning cloth by new one. If a cleaning cloth smeared with grease is used, grease may attach to the places where it should not.
- Do not insert a cassette tape before a cleaning fluid completely evaporates after cleaning.

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

CAUTION

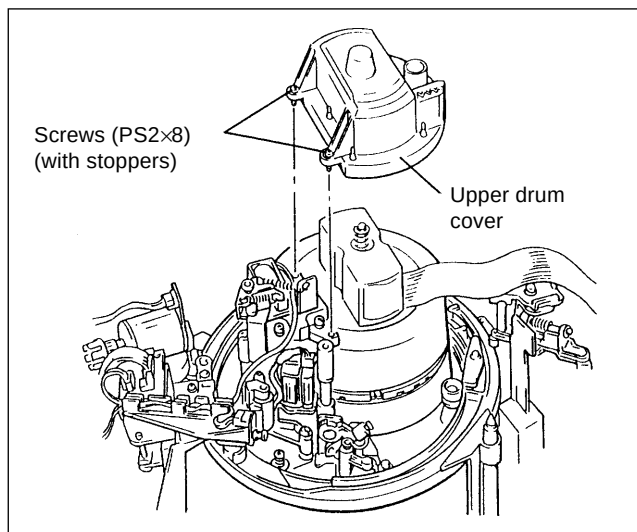
Do not use a cotton swab to clean the rotary heads.

Procedures

1. Turn the power off.
2. Remove the upper lid.
(Refer to Section 2-2-1.)
3. Remove the plate MD.
(Refer to Section 2-2-2.)
4. Remove the cassette compartment.
(Refer to Section 2-3.)
5. Loosen the two screws and remove the upper drum cover.

Note

These screws cannot be removed because of stoppers.

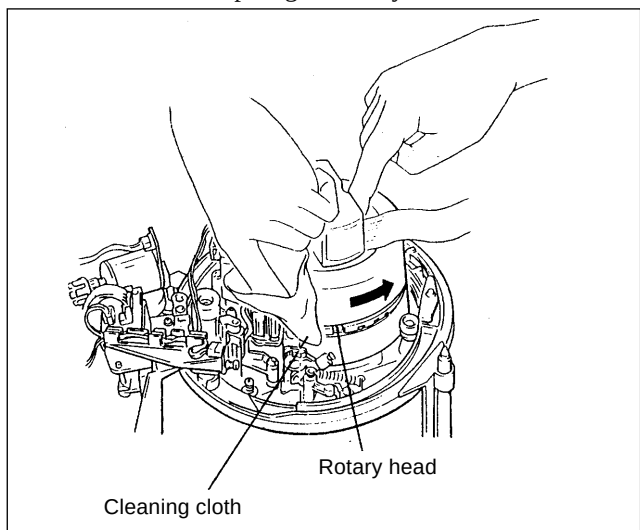


Removal/Installation of Upper Drum Cover

6. Hold the cleaning cloth moistened with cleaning fluid keeping it from becoming wrinkled. And press the cleaning cloth slightly against the rotary heads.
7. Rotate the inner drum slowly counterclockwise two or three turns and clean the rotary heads with the cleaning cloth held.

CAUTION

Be sure to rotate the inner drum counterclockwise and clean the rotary heads along the circumference. Do not rotate the inner drum in the direction opposite to the specified direction (clockwise) or clean it in the vertical direction. This may damage the rotary heads and the brush/slip ring assembly.



Cleaning by Cleaning Cloth

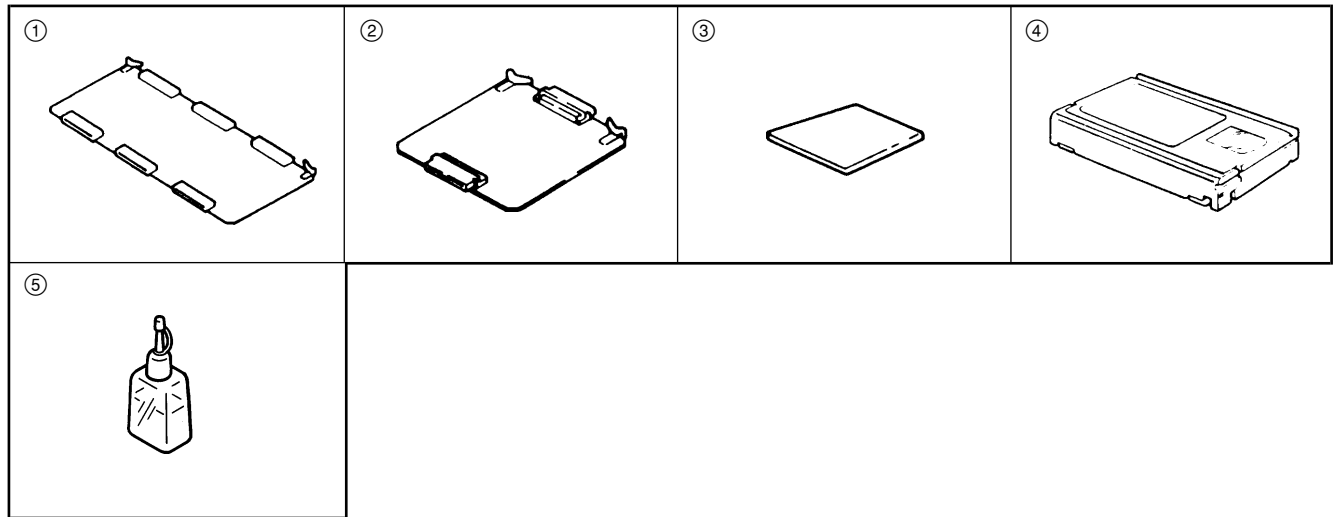
8. After cleaning, wipe it with a dry cleaning cloth two or three times.
9. Tighten the two screws while pressing the upper drum cover towards the drum support direction.

Tightening torque: $14.7 \times 10^{-2} \text{ N} \cdot \text{m}$ (1.5 Kgf•cm)

2-10. Fixture and Measuring Equipment for Adjustment

2-10-1. Fixture

Fig. No.	Part No.	Description	Inscription No.	For use
1	J-6269-800-A	Extension Board (L), EX-365	———	Large-sized printed circuit board for check and adjustment
2	J-6269-810-A	Extension Board (S), EX-377	———	Small-sized printed circuit board for check and adjustment
3	3-184-527-01	Cleaning Cloth (15 cm × 15 cm)	———	Cleaning
4	8-960-073-01	Alignment Tape, ZR5-1	———	Digital Video and Audio alignments (for NTSC)
	8-960-073-11	Alignment Tape, ZR2-1	———	Tracking alignments (for digital) (for NTSC)
	8-960-073-51	Alignment Tape, ZR5-1P	———	Digital Video and Audio alignments (for PAL)
	8-960-073-61	Alignment Tape, ZR2-1P	———	Tracking alignments (for digital) (for PAL)
5	9-919-573-01	Cleaning Liquid	———	Cleaning



2-10-2. Measuring Equipment

It is recommended to use the measuring equipments listed below or the equivalents.
Each equipment is available as a standard product.

Equipment	Model Name	Remarks
Oscilloscope	TEKTRONIX 2465B	
Wave Form/Vector Monitor	TEKTRONIX 1750 or 1780R	for measuring video level (for NTSC)
	TEKTRONIX 1751 or 1781R	for measuring video level (for PAL)
Audio Level Meter	HEWLETT PACKARD HP3400A	
Audio Analyzer	TEKTRONIX AA501A(OP.02)	for measuring distortion and levels
Frequency Counter	ADVANTEST TR5821AK	
Digital Voltmeter	ADVANTEST TR6845	

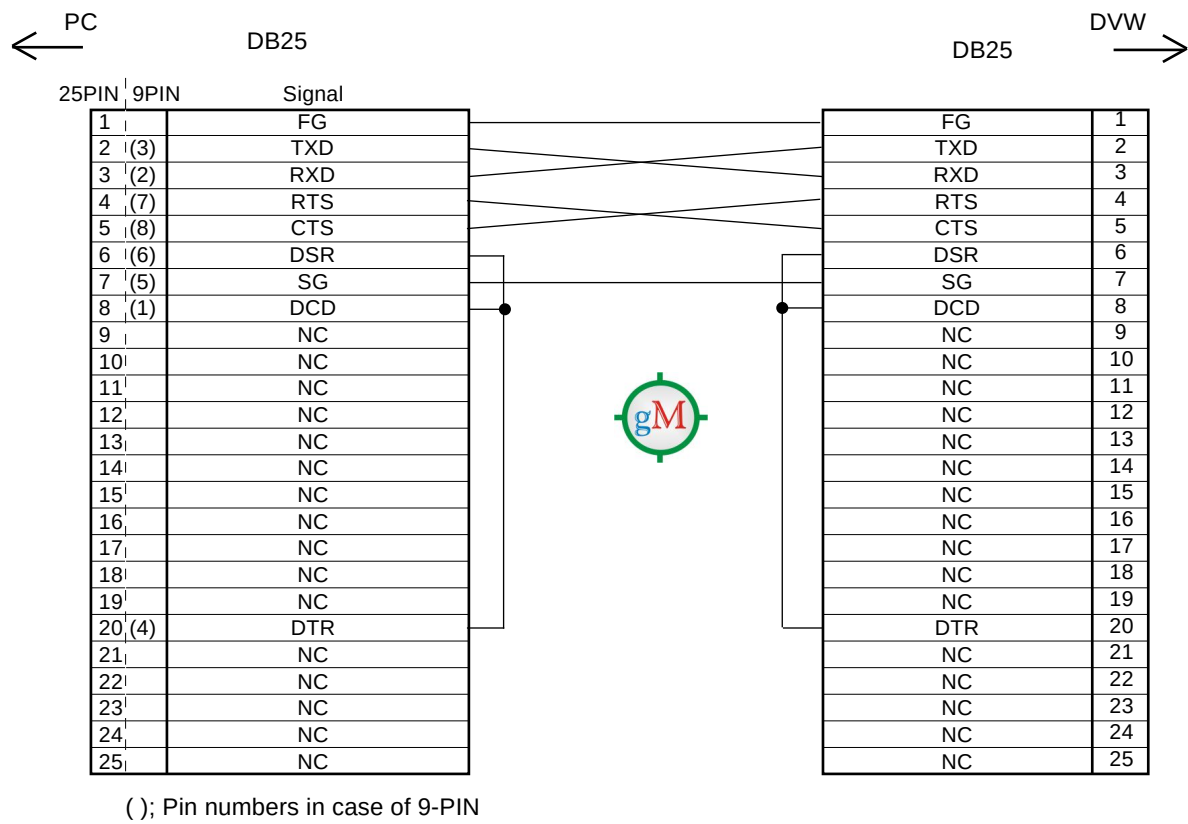
2-11. ISR

ISR: Stands for Interactive Status Reporting system. The system that can do the diagnosis or operation monitor for each broadcast products from PC by using BZI-500/501(ISR Software).

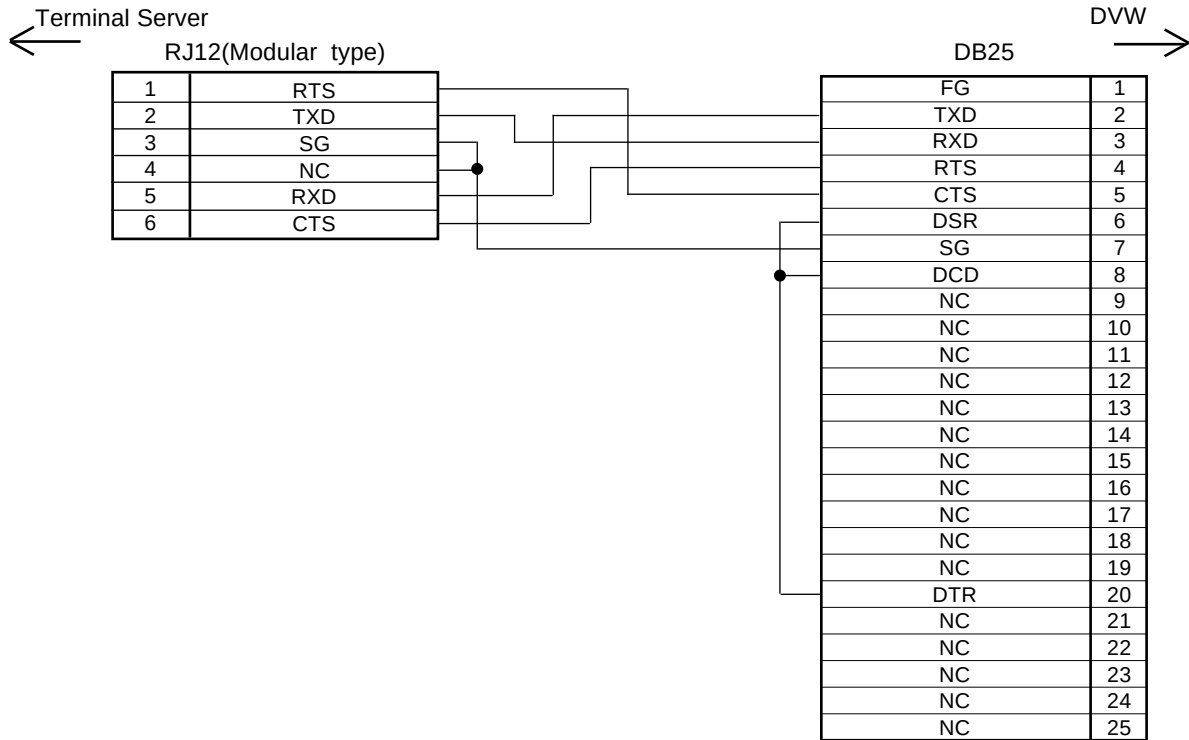
CONNECTION INFORMATION

Refer to the following information in preparing the cables.

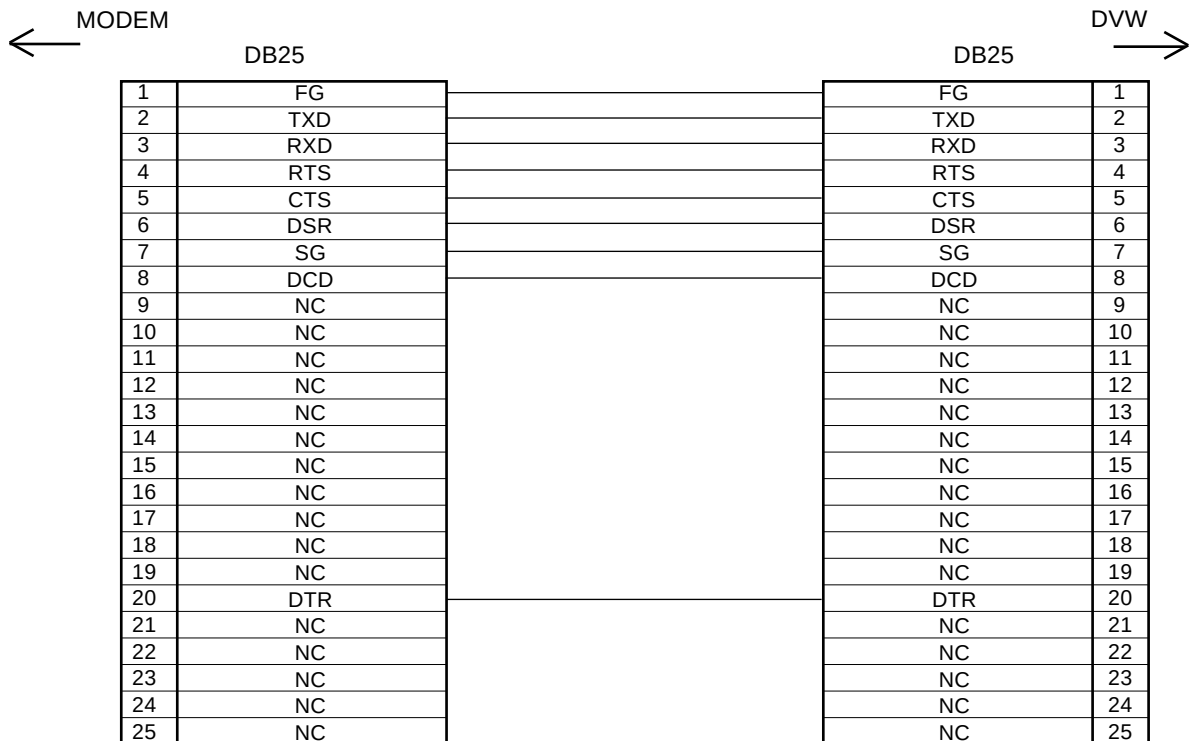
- 1. In case of the direct connection with PC.



2. In case of the connection with PC via LAN (Terminal Server: 6 pin port).
 * The connection will change according to the maker of Terminal Server.



3. In case of the connection with PC via MODEM.



Section 3

Error Messages

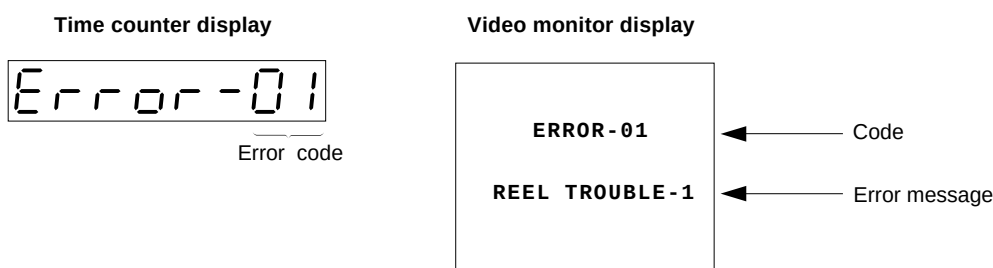
3-1. Error Message

This unit features self-diagnostics.

When trouble is detected, an error code is displayed immediately in the time counter display on the lower control panel, an error code and message are superimposed on the video monitor connected to the VIDEO OUTPUT COMPOSITE 2 connector and the RF ADAPTOR VIDEO connector.

Furthermore, as for the interface error (error code 92, 93, 96 and 98), interface object which error occurred replaced by sub error message on the video monitor.

(To display error code and message on the video monitor, the CHARACTER switch on the system setup panel must be set to ON.)



Code	Error message	Description	Detection
01	REEL TROUBLE-1	The slack of the tape is detected during threading or unthreading, and then tape protection is done.	Detected when the ratio of the FG frequency at a supply reel, take-up reel and threading motor is less than the specified value.
02	REEL TROUBLE-2	The slack or breaking of the tape is detected in search, fast forward, or rewind mode, and then tape protection is done.	Detected when the ratio of the FG frequency at a supply reel and take-up reel is less than the specified value.
03	REEL TROUBLE-3	The slack or breaking of the tape is detected in playback mode, or either of the lock of the supply or take-up reel is detected, and then tape protection is done.	Detected when the FG frequency at a supply or take-up reel is zero (0), or when the tension detected from a tension sensor is less than 15 g.
04	REEL TROUBLE-4	It is detected that the tape does not run at the speed of designation in fast forward or rewind mode, and then tape protection is done.	Depends on the comparison between the tape speed using the FG frequency at supply and take-up reels and the designated speed.
05	REEL TROUBLE-5	It is detected that the supply or take-up reel cannot stop with a cassette is not inserted, or detected that over current has been flowing to supply and take-up reels.	Detected using the FG frequency or current at supply and/or take-up reels.
06	TAPE TENSION ERROR	When excessive tension is detected, tape protection is done.	Detected when the tension detected from a tension sensor is more than 55 g.
07	CAPSTAN TROUBLE	It is detected that the tape does not run at the speed of designation in play or search mode, and tape protection is done.	Detected at the tape speed detected from the FG frequency at a capstan motor.
08	DRUM TROUBLE	It is detected that drum motor rotation is not normal, and then tape protection is done.	Detected when the drum speed obtained from the speed FG of the drum motor is less than the specified value.
09	TH/UNTH MOTOR TIME OUT	It is detected that threading or unthreading is not completed, and then tape protection is done.	Detected when threading or unthreading is not completed within ten seconds after it is started.

(Continue)

3-1. Error Message

(Continued)

Code	Error message	Description	Detection
0A	THREADING TROUBLE	It is detected that threading cannot be done, and then tape protection is done.	Detected when the tape top sensor is acted during threading after the short FF mode is automatically entered three times.
10	HUMID	Condensation is detected.	Detected using a DEW (condensation) sensor.
11	TAPE TOP/END SENSOR TROUBLE	The tape top or end sensor operation is defective.	Detected when the tape top and end are detected at the same time.
12	TAPE TOP SENSOR TROUBLE	The tape top sensor operation is defective.	Detected when the tape top continues for more than seven seconds.
13	TAPE END SENSOR TROUBLE	The tape end sensor operation is defective.	Detected when the tape end continues for more than seven seconds.
14	FAN MOTOR TROUBLE	The operation of the fan motor is defective.	Detected according to the period of a ripple noise at the fan motor terminal.
20	CASSETTE COMPARTMENT MOTOR LOCK	It is detected that cassette up/down operation is not completed, and then tape protection is done.	Detected when cassette up/down operation is not completed within four seconds after it is started.
21	REEL SHIFT MOTOR LOCK	It is detected that driving of the L position to S position or the S position to L position in the reel table is not completed, and then tape protection operation is done.	Detect when reel table driving is not completed within four seconds after it is started.
22	REEL POSITION SENSOR TROUBLE	The operation of the L/S position sensor of the reel table is defective.	Detected when the L and S positions are detected at the same time.
90	KEY BOARD INTERFACE ERROR	The interface between the KY-231 board and SS-52 board is defective.	Detected when no interface signal is sent from the SS-52 board to the KY-231 board.
91	1/2 VD NOT EXIST	No 1/2 VD signal input to SS-52 board is detected.	Detected when no 1/2 VD signal input to the SS-52 board.
92	INTERNAL INTERFACE ERROR	The serial or parallele interface between the following board and SS-52 board is defective. (DPR-36 board; parallele interface)	Detected when no interface signal is sent from the each board to the SS-52 board three times continuously.
	sub error message		
	FP	FP : IC6 of FP-58 board	
	APR	APR : IC51 of APR-1 board	
	SWC	SWC : IC2 of SWC-19 board	
	DPR	DPR : DPR-36 board	
	VPR	VPR : IC753 of VPR-1 board	
93	CPU INITIALIZE ERROR	The interface between the following CPU on SS-52 board and main CPU (of IC5 on SS-52 board) is defective when the POWER switch is turned ON.	Detected when no interface signal is sent from the each CPU to the main CPU at the POWER switch is turned ON state.
	sub error message		
	DT	DT : IC2104	
	main servo (SV1)	main servo (SV1) : IC750	
	drum servo (SV2)	drum servo (SV2) : IC700	
94	CPU INITIALIZE ERROR 2	The operational defect of main CPU (of IC5 on SS-52 board) is defective when the POWER switch is turned ON. (Not display on the video monitor)	Detected when no interface signal is sent from the main CPU to the sub CPU (of IC50 on SS-52 board) at the POWER switch is turned ON state.

(Continue)

(Continued)

Code	Error message	Description	Detection
96	NV-RAM TROUBLE	The operational defect of the NV-RAM (setup menu data) on the SWC-19 board or SS-52 board is detected.	
	sub error message	Then, reset the data in the NV-RAM to the condition at exfactory for menu-1, 2, 3, and id code.	
	menu-1	menu-1 : IC13 of SS-52 board	Detected by the NV-RAM data's checksum.
	menu-2	menu-2 : IC13 of SS-52 board	
	menu-3	menu-3 : IC13 of SS-52 board	
	id code	id code : IC3, 4, 5 of SWC-19 board	Detected when the ID codes of three NV-RAMs are not equal.
	SWC-1	SWC-1 : IC3 of SWC-19 board	Detected when no interface signal is sent from the each NV-RAM to IC2 on the SWC-19 board.
	SWC-2	SWC-2 : IC4 of SWC-19 board	
	SWC-3	SWC-3 : IC5 of SWC-19 board	
	SWC-4	SWC-4 : IC6 of SWC-19 board	
97	SV NV-RAM TROUBLE	The operational defect of the NV-RAM (servo adjustment data) on the DR-200 board is detected.	Detected by the NV-RAM data's checksum.
98	NV-RAM TROUBLE	The operational defect of the NV-RAM (IC6) (RF adjustment data) on the SWC-19 board is detected.	Detected by the NV-RAM data's checksum.
	sub error message RF ADJUST DATA LOST	Then, reset the data in the NV-RAM to the condition at exfactory.	

Section 4

Periodic Maintenance and Inspection

4-1. Periodic Check

To make the most of the functions, fully realize performance of the unit, lengthen the life of the unit and tape, a periodic check is recommended.

4-1-1. Hours Meter

This unit can display an hours meter on the time counter display of the upper control panel or on the monitor connected to this unit. Perform a periodic check with this hours meter as a reference.

1. Display procedure

Refer to Section 3-2 in Operation Manual.

2. Contents of display

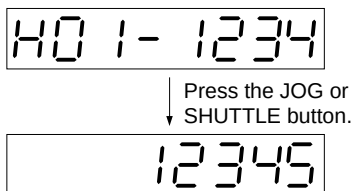
SET-UP MENU	DESCRIPTION	TIME COUNTER DISPLAY	MONITOR DISPLAY
H01: OPERATION HOURS	Accumulated hours when the power of the unit is on.	Display the time by ten hours. (Note)	Display the time by an hour.
H02: DRUM RUNNING HOURS	Accumulated hours when the drum rotates in the threading end state.	Display the time by ten hours. (Note)	Display the time by an hour.
H03: TAPE RUNNING HOURS	Accumulated hours when the tape runs in the PLAY and SEARCH modes (not including STILL mode).	Display the time by ten hours. (Note)	Display the time by an hour.
H04: THREADING COUNTER	Accumulated number of threading and unthreading times.	Display the number by ten times. (Note)	Display the actual number.

(Note) While pressing the JOG or SHUTTLE button on the lower control panel, display the time by an hour (or display the actual number).

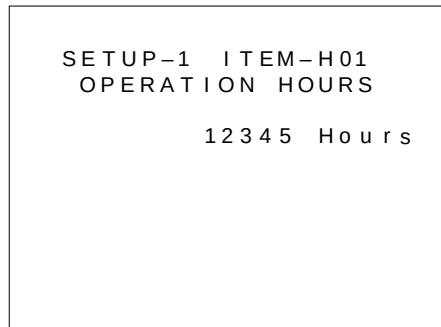
<Example>

In a case of the total hours that the power of the unit has been turned on is 12,345 hours:

• Time Counter Display



• Monitor Display



4-1-2. Periodic Check List

The replacement time shown in the table below is not the guarantee term of parts. Use this table as guidelines for maintenance and inspection. The replacement time of parts varies depending on the operating environment and conditions of the unit.

Note

The part marked with “↓” in the table is replaced simultaneously with when the part in the column below its mark is replaced.

R : Replace the part. C : Perform check (adjustment).

Item	Menu	Inspection Hours (h)						Replacement Parts			
	No.	1000	2000	3000	4000	5000	6000	Part Name	Part No.	Q'ty	
Drum Block											
Inner Drum Assembly	H02	R	R	↓	R	R	↓	DJR-07A-R: DVW-522	A-8260-748-D	1	
								DJR-08A-R: DVW-522P	A-8260-749-D	1	
Brush/Slip Ring Assembly	H02	—	—	↓	—	—	↓	SR9 ASSY (RP), BRUSH	A-8267-572-A	1	
Drum Assembly	H02	—	—	R	—	—	R	DJH-07A-R: DVW-522	A-8260-744-D	1	
								DJH-08A-R: DVW-522P	A-8260-745-D	1	
Cleaners											
Cleaning Roller	H02	R	R	↓	R	R	↓	ROLLER ASSY, VCLEANING	X-3167-281-2	1	
Rotary Head Cleaner Assembly	H02	—	—	R	—	—	R	CLEANER ASSY, VIDEO HEAD	A-8267-398-J	1	
AT Head Cleaner	H02	R	R	R	R	R	R	ARM ASSY, CL	X-3167-053-2	1	
Tape Running System											
Pinch Roller	H03	R	R	R	R	R	R	ARM ASSY, PINCH	X-3167-054-3	1	
Audio/TC Head	H03	—	—	C	C	C	R	HEAD, AUDIO PS244-2103J	8-825-779-02	1	
CTL Head	H03	—	—	R	—	—	R	HEAD, CTL PS244-21B	8-825-554-83	1	
Capstan Motor	H03	—	—	R	—	—	R	MOTOR, DC SP37AA	1-698-179-11	1	
Driving System											
Pinch Solenoid	H03	—	—	—	—	—	R	SOLENOID, PLUNGER	1-454-338-00	1	
	H04	Replace when used 200,000 times									
Brake Lining	H03	—	—	R	—	—	R	LINING ASSY	X-3717-205-1	2	
Reel Motor Assembly	H03	—	—	R	—	—	R	S Side: RM ASSY	A-8267-774-A	1	
								T Side: RM ASSY	A-6737-207-A	1	
Others											
Fan Motor	H01	Replace when used 10,000 H						FAN, DC	1-541-431-41	2	
Filter of the Upper Drum Cover	H02	R	R	R	R	R	R	FILTER	3-182-649-01	1	

To maintain the steady performance, these are recommended to clean the tape running system and automatic adjustment of RF system every the following hours as a guide.

- every 50 hours (H02) : Cleaning by cleaning tape (Refer to Section 2-9-1.)
- every 200 hours (H02) : Take the following steps to clean.
 1. Cleaning by cleaning tape (Refer to Section 2-9-1.)
 2. Cleaning by cleaning cloth (Refer to Section 4-2-2 through 4-2-6.)
- every 500 hours (H02) : Perform “A12 : ADV EQUALIZER”.
(Refer to Section 1-3 in Volume 1 of MAINTENANCE MANUAL Part 2.)

	Procedure (Refer to Volume 1 of MAINTENANCE MANUAL Part 2)	Remarks
	Refer to Section 2-2-1.	In an environmental condition of high humidity and excessive dust to operate the unit, it may cause in shortening the life of the heads. Therefore, it is recommended to use the unit in an air-conditioned place at middle temperature and humidity of the specifications, and lesser dust circumstances. In addition, the tapes should be kept in the same conditions.
	Refer to Section 2-2-2.	
	Refer to Section 2-2-3.	
	Refer to Section 2-2-4.	It is recommended to replace the CR spacer (3-182-765-02) at the same time.
	Refer to Section 2-2-4.	
	Refer to Section 2-2-5.	
	Refer to Section 2-2-6.	
	Refer to Section 2-2-7.	C= Adjust the CUE frequency response. (Refer to Section 6-3-1 in Volume 1 of MAINTENANCE MANUAL Part 2.)
	Refer to Section 2-2-8.	
	Refer to Section 2-2-9.	
	Refer to Section 2-2-10.	Replace the pinch solenoid when the replacement time or count is reached whichever is earlier.
	Refer to Section 2-2-11.	
	Refer to Section 2-2-12.	
	Refer to Section 2-2-13.	
	Refer to Section 2-2-14.	

Note

Replace the parts shown in the table below periodically when the threading/unthreading operation is repeated frequently.

Item	Menu	Inspection Time	Replacement Parts			
	No.		Part Name	Part No.	Q'ty	
Brake Solenoid	H04	Replace when used 200,000 times	PLUNGER SOLENOID	1-454-417-41	2	
S Tension Regulator Assembly			REGULATOR ASSY, TENSION	A-8267-795-C	1	
T Tension Regulator Assembly			T-TEN ASSY	A-8267-423-B	1	
T Drawer Arm Assembly			DRAWER ASSY, T	A-8267-381-E	1	
Gear Box Assembly			BOX ASSY, GEAR	A-8267-424-A	1	
Threading Ring Assembly			RING ASSY, THREADING	A-8267-395-E	1	
Ring Roller			ROLLER, RING	3-180-677-01	2	
			ROLLER, RING B	3-180-679-01	1	
Pinch Arm Guard			GUARD, PINCH ARM	3-180-853-01	1	
CL Guide Rail			RAIL, CL GUIDE	3-180-874-02	1	
Cassette Compartment Assembly			CASSETTE COMPARTMENT ASSY	A-8267-863-B	1	



	Procedure (Refer to Volume 1 of MAINTENANCE MANUAL Part 2)	Remarks
	Refer to Section 2-3-2.	
	Refer to Section 2-3-11.	
	Refer to Section 2-3-12.	
	Refer to Section 2-3-13.	
	Refer to Section 2-3-8.	
	Refer to Section 2-3-10.	
	Refer to Section 2-3-9.	
	Refer to Section 5-1. (*) (Exploded views)	(*) MAINTENANCE MANUAL Part-2 Volume 2
	Refer to Section 2-3. (*)	(*) MAINTENANCE MANUAL Part-1

4-2. Cleaning

To make the most of the functions, fully realize the performance of this unit, and to lengthen the life of the unit and tape, clean the components often.

4-2-1. General Information for Cleaning

1. Cautions

- Turn the power off before cleaning.
- Each block in the mechanical deck consists of a precision part and is adjusted precisely. Be careful not to damage each part and to apply an excessive force during cleaning.
- Do not touch the greased portions during cleaning. If grease attaches to a cleaning cloth, replace the cleaning cloth by new one. If a cleaning cloth smeared with grease is used, grease may attach to the places where it should not.
- Do not insert a cassette tape before a cleaning fluid completely evaporates after cleaning.

2. Preparation

- (1) Turn the power off.
- (2) Remove the upper lid. (Refer to Section 2-2-1.)
- (3) Remove the plate MD. (Refer to Section 2-2-2.)
- (4) Remove the cassette compartment. (Refer to Section 2-3.)

4-2-2. Rotary Heads Cleaning

Caution

The rotary heads are the part that can be damaged easily. Be careful not to damage the rotary heads during cleaning.

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

CAUTION

Do not use a cotton swab to clean the rotary heads.

Procedures

1. Loosen the two screws and remove the upper drum cover.

Note

These screws cannot be removed because of stoppers.

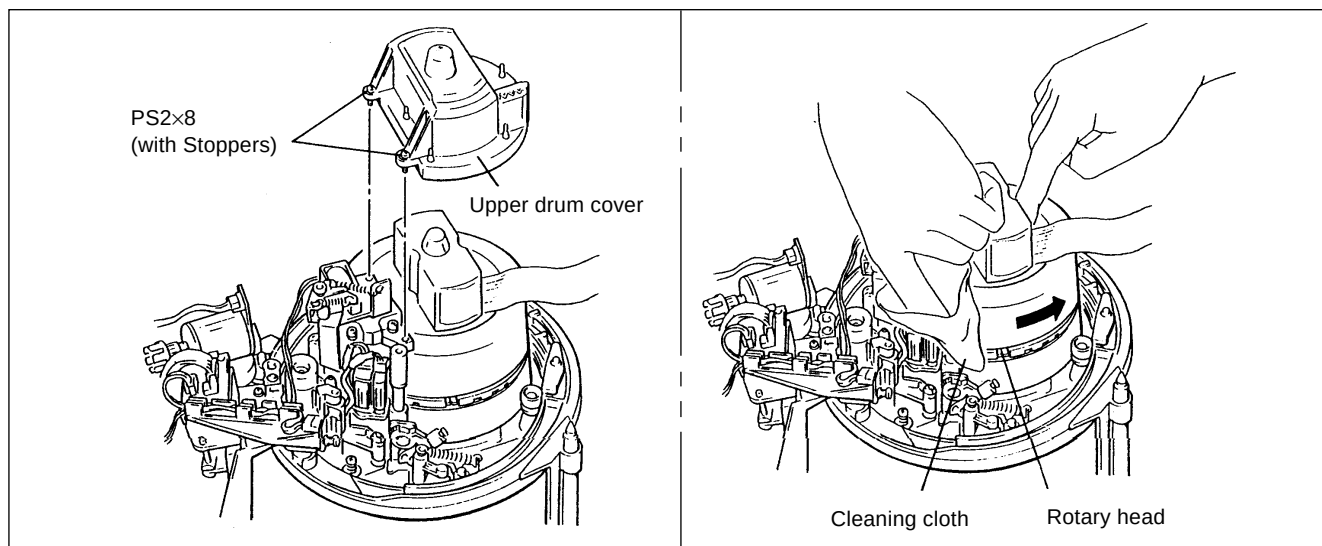
2. Hold the cleaning cloth moistened with cleaning fluid keeping it from becoming wrinkled. And press the cleaning cloth slightly against the rotary heads.
3. Rotate the inner drum slowly counterclockwise two or three turns and clean the rotary heads with the cleaning cloth held.

CAUTION

Be sure to rotate the inner drum counterclockwise and clean the rotary heads along the circumference. Do not rotate the inner drum in the direction opposite to the specified direction (clockwise) or clean it in the vertical direction. This may damage the rotary heads and the brush/slip ring assembly.

4. After cleaning, wipe it with a dry cleaning cloth two or three times.
5. Tighten the two screws while pressing the upper drum cover towards the drum support direction.

Tightening torque: $14.7 \times 10^{-2} \text{ N} \cdot \text{m}$ (1.5 kgf·cm)



Rotary Heads Cleaning

4-2-3. Upper Drum's Tape Running Surface Cleaning

Caution

Be careful not to damage the upper drum during cleaning. Pay careful attention when cleaning the edge portion below the upper drum because it is located near the rotary heads.

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Procedures

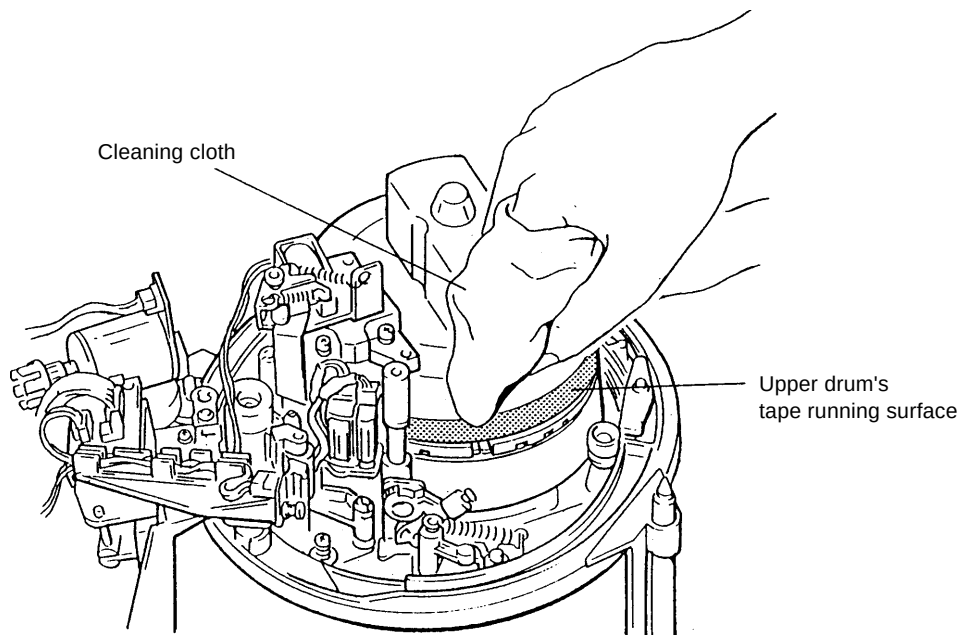
1. Press the cleaning cloth moistened with a cleaning fluid slightly against the upper drum's tape running surface (shaded portion in the figure).

2. Clean the upper drum's tape running surface along the circumference two or three times.

CAUTION

Pay careful attention when cleaning the edge portion below the upper drum.

3. After cleaning, wipe it with a dry cleaning cloth two or three times.



Upper Drum's Tape Running Surface Cleaning

4-2-4. Lower Drum's Tape Running Surface and Lead Surface Cleaning

Caution

Be careful not to damage the lower drum (specially lead surface) during cleaning. Pay careful attention when cleaning the edge portion above the lower drum because it is located near the rotary heads.

Tools

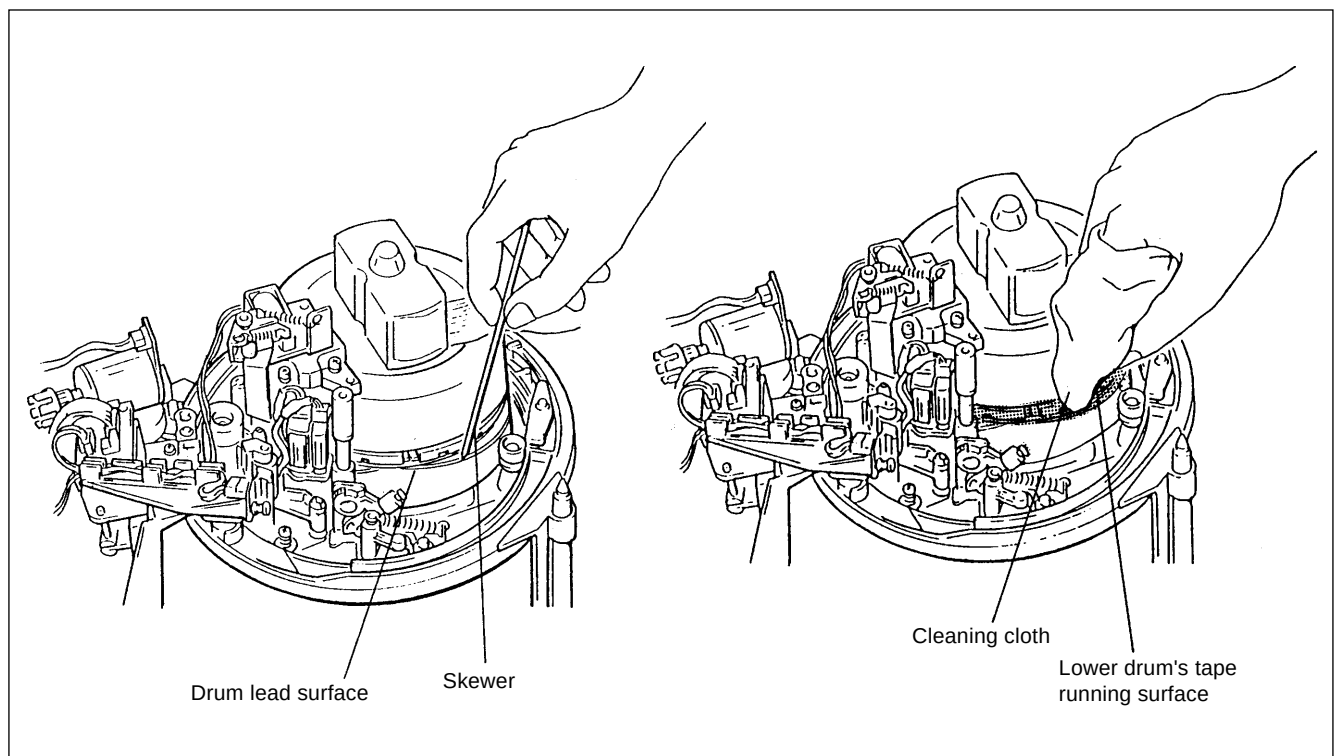
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Skewer or an equivalent (A metallic skewer cannot be used.)

Procedures

1. As shown in the figure, put a skewer (or an equivalent) along the drum lead surface and remove the magnetic powder.

CAUTION

1. Do not use a metallic skewer instead of the skewer. This may damage the tape running surface.
 2. Tracking may be badly influenced when magnetic powder attaches to the drum lead surface. Remove the magnetic powder completely during cleaning.
2. Clean the drum lead surface and lower drum's tape running surface (shaded portion in the figure) with a cleaning cloth moistened with a cleaning fluid.
 3. After cleaning, wipe it with a dry cleaning cloth two or three times.



Lower Drum's Tape Running Surface and Lead Surface Cleaning

4-2-5. Stationary Heads Cleaning

Caution

Be careful not to damage the head surface when cleaning the stationary heads.

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

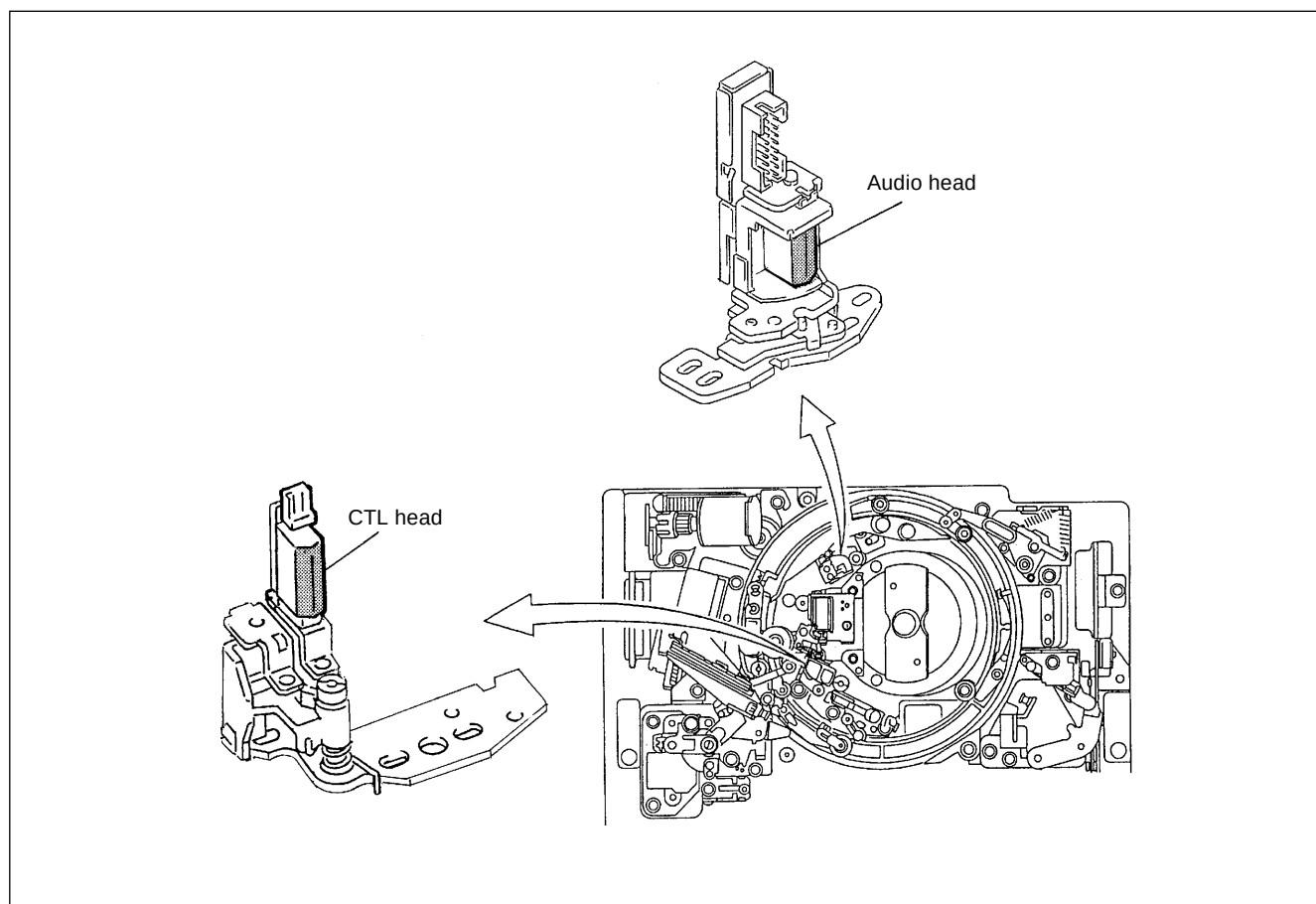
Procedures

1. Clean the tape running surfaces of the audio/TC head and CTL head in the vertical direction with a cleaning cloth moistened with a cleaning fluid.

CAUTION

An error may occur in the playback when magnetic powder attaches to the head gap portion of the audio/TC head and CTL head. Remove the magnetic powder completely during cleaning.

2. After cleaning, wipe it with a dry cleaning cloth two or three times.



Stationary Heads Cleaning

4-2-6. Tape Running System and Tape Cleaner Cleaning

Warning

The tape cleaner has a sharp edge. Do not touch the edge with bare hands. Pay careful attention when cleaning the tape cleaner.

Tools

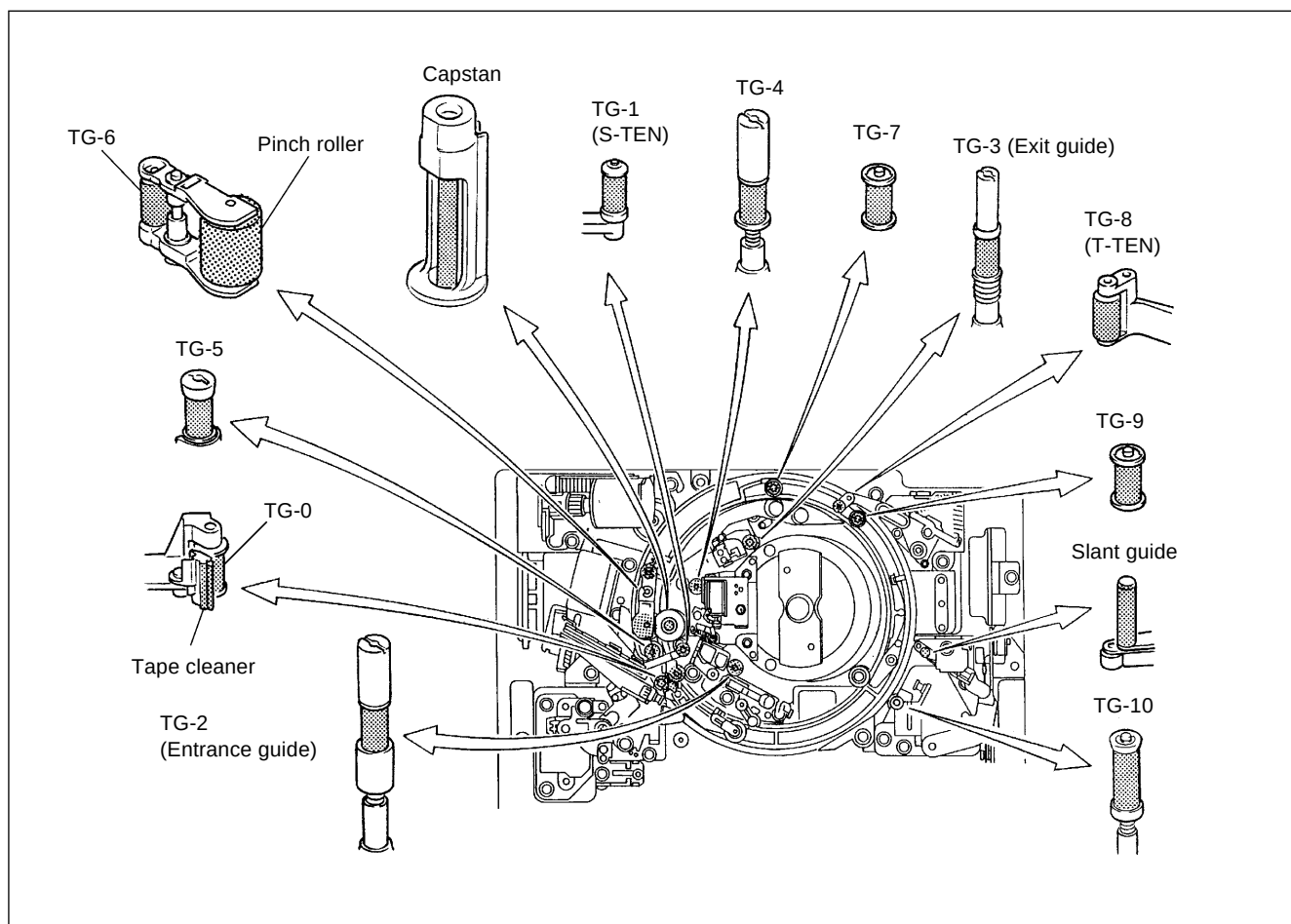
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Procedures

1. Clean the tape running surfaces (shaded portions in the figure) of each guide with cleaning cloth moistened with a cleaning fluid.
2. After cleaning, clean it with a dry cleaning cloth two or three times.
3. Pass a piece of paper approximately this manual's paper thick through the clearance of the tape cleaner from top to bottom two or three times. At this time, do not move the paper from bottom to top.

WARNING

Do not touch the edge portion of the tape cleaner with bare hands.



Tape Running System and Tape Cleaner Cleaning

4-2-7. Fan Motor Cleaning

Caution

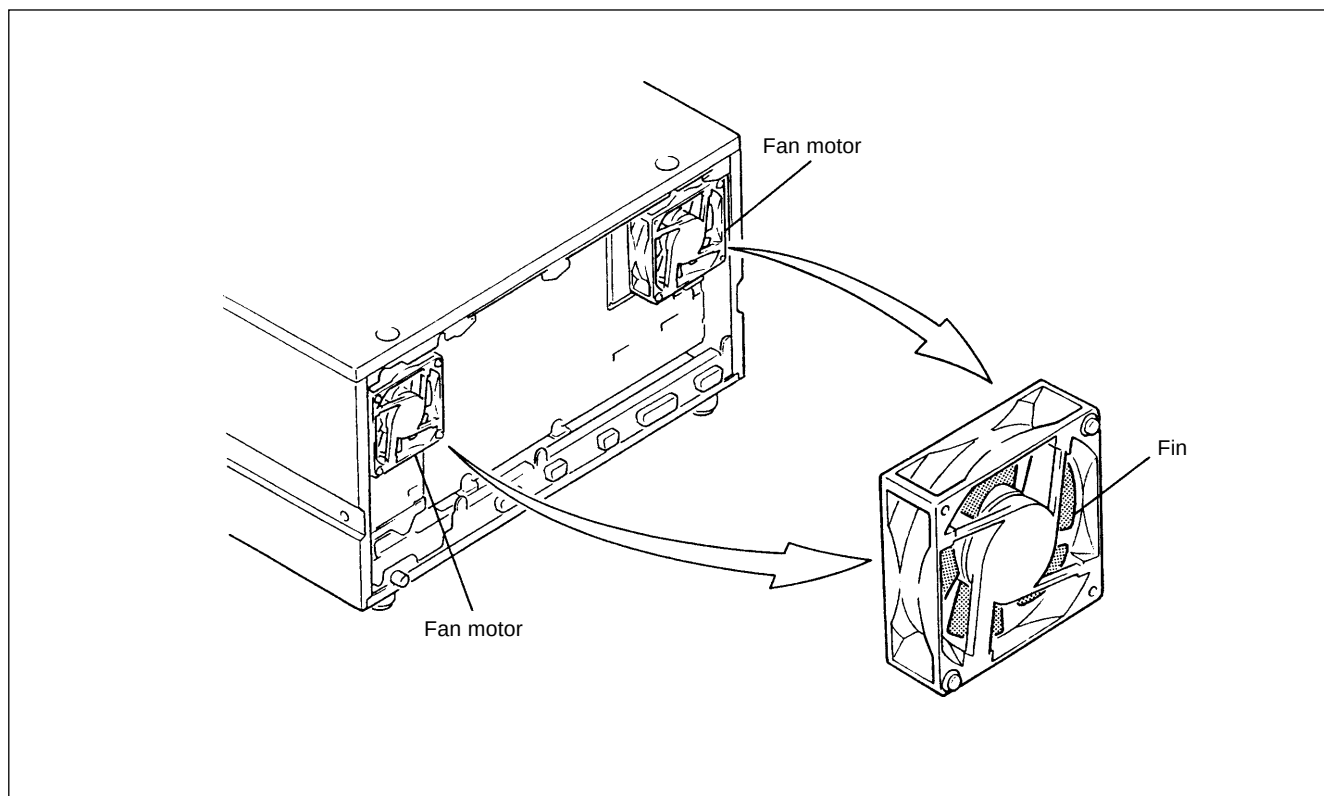
The temperature in the unit increases when dust attaches to the fan motor and when the air flow is disturbed. This may badly influence the performance and life of the unit. Clean the fan motor on the rear panel periodically because it accumulates dust easily.

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Vacuum cleaner

Procedures

1. Remove the power panel. (Refer to Section 2-2-1.)
2. Remove the connector panel. (Refer to Section 2-2-3.)
3. Remove the dust on the fan motors using a vacuum cleaner.
4. Clean the fin (shaded portion in the figure) with cleaning cloth moistened with cleaning fluid.
5. Install the connector panel. (Refer to Section 2-2-3.)
6. Install the power panel. (Refer to Section 2-2-1.)



Fan Motor Cleaning

4-2-8. Cassette Compartment Cleaning

Cautions

- Be careful not to apply an excessive force to the compartment block when cleaning the cassette compartment.
- Do not clean the cassette door with alcohol. This may cause a crack.

Tools

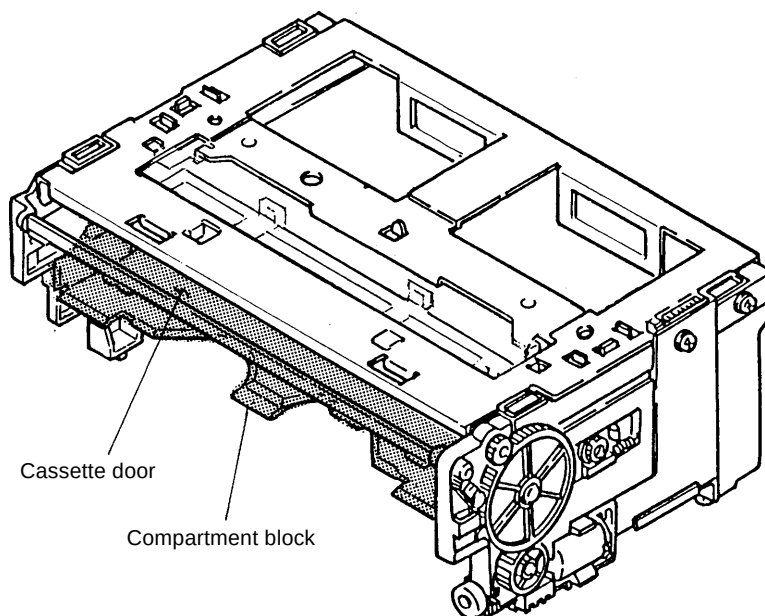
- Cloth (or Gauze)
- Vacuum cleaner

Procedures

1. Remove the cassette compartment from the unit. (Refer to Section 2-3.)
2. Remove the dust on the cassette compartment from the cassette insertion inlet using a vacuum cleaner.
3. Clean the compartment block (shaded portion in the figure) with a dry cloth (or gauze).

CAUTION

Do not apply an excessive force to the compartment block.



Cassette Compartment Cleaning



Section 5

Maintenance Mode

5-1. Outline

This unit has the maintenance mode required for maintenance and troubleshooting.

The maintenance mode is as described below.

Each mode consists of some menus and submenus.

(For the menu tree, refer to pages 5-6, 5-7.)

This section explains CHECK modes (C0, C1, C4).

For ADJUST modes (A0, A1, A2), refer to the Volume 1 of the Maintenance Manual Part 2.

C0 : SERVO/DT CHECK

C1 : RF CHECK

C2 : AUDIO/VIDEO CHECK

C4 : OTHERS CHECK

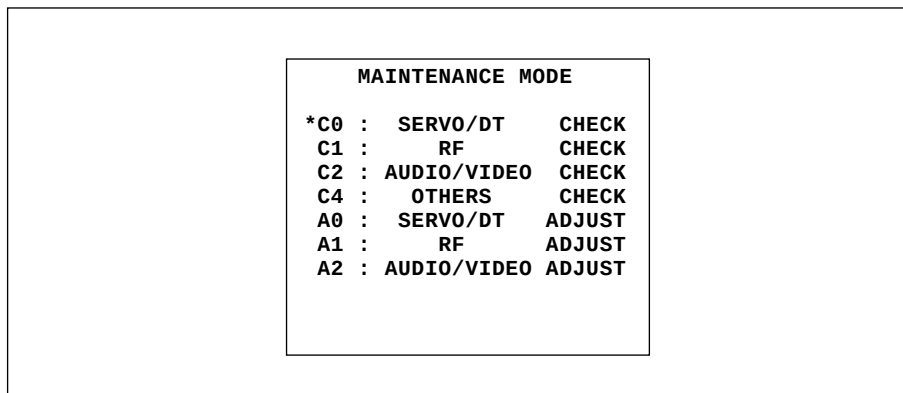
A0 : SERVO/DT ADJUST

A1 : RF ADJUST

A2 : AUDIO/VIDEO ADJUST

The contents of the maintenance mode are superimposed on the video monitor that is connected to the VIDEO OUTPUT COMPOSITE 2 connector or RF ADAPTOR VIDEO connector.

The figure below shows an example of the screen display.



Superimposed Screen (Mode Screen when Maintenance Mode is Activated)

The buttons etc. related to the maintenance mode are as follows:

① Time counter (Lower control panel)

The menu number is displayed in the blinking/lighting state during menu assignment.

For the manual adjustment, data is displayed in the blinking state.

Be sure to use a video monitor because the information that can be displayed on the time counter is restricted in the maintenance mode.

② MENU button (Lower control panel)

In the maintenance mode, the MENU button has the same function as switch ⑨ S301 on the SS board.

③ SET button (Lower control panel)

In the maintenance mode, the SET button has the same function as switch ⑧ S300 on the SS board.

With DIP switch ⑩ S100-7 on the SS board set to ON (upper position), the maintenance mode is entered when this button is pressed while pressing the ④ CTL button in the setup menu mode.

④ CTL button (Lower control panel)

With DIP switch ⑩ S100-7 on the SS board set to ON (upper position), the maintenance mode is entered when the ③ SET button is pressed while pressing this button in the setup menu mode.

⑤ SHUTTLE button (Lower control panel)

When the ⑦ search dial is turned while pressing this button during manual adjustment, the adjustment data can be changed.

⑥ JOG button (Lower control panel)

The JOG lamp lights when this button is pressed once. The ⑦ search dial is then set to the JOG mode. When the ⑦ search dial is turned while pressing this button during manual adjustment, the adjustment data can be changed.

⑦ Search dial (Lower control panel)

The search dial selects each menu in the JOG mode.

To change the adjustment data during manual adjustment, turn this search dial while pressing the ⑥ JOG button or ⑤ SHUTTLE button.

The SHUTTLE and JOG modes are alternately selected every time this dial is pressed. The lamp (SHUTTLE or JOG) indicating the corresponding mode then lights.

⑧ S300 (SS board): DIAG/ADJUST 1 switch (ADJ +)

Press this switch to activate the maintenance mode.

In the maintenance mode, press this switch to execute the menu or submenu selected by the ⑦ search dial.

In the maintenance mode, the ③ SET button is also the same in function as this switch.

⑨ S301 (SS board): DIAG/ADJUST 2 switch (ADJ -)

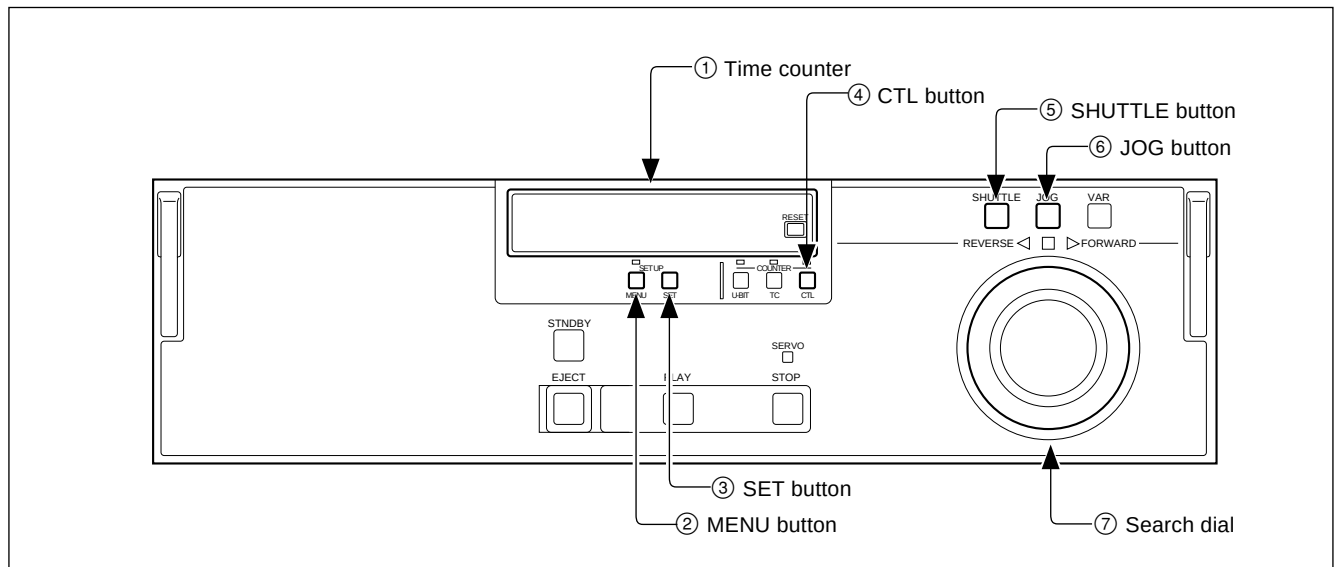
In the maintenance mode, press this switch to return to the preceding screen.

To exit the maintenance mode, press this switch when the mode screen is displayed.

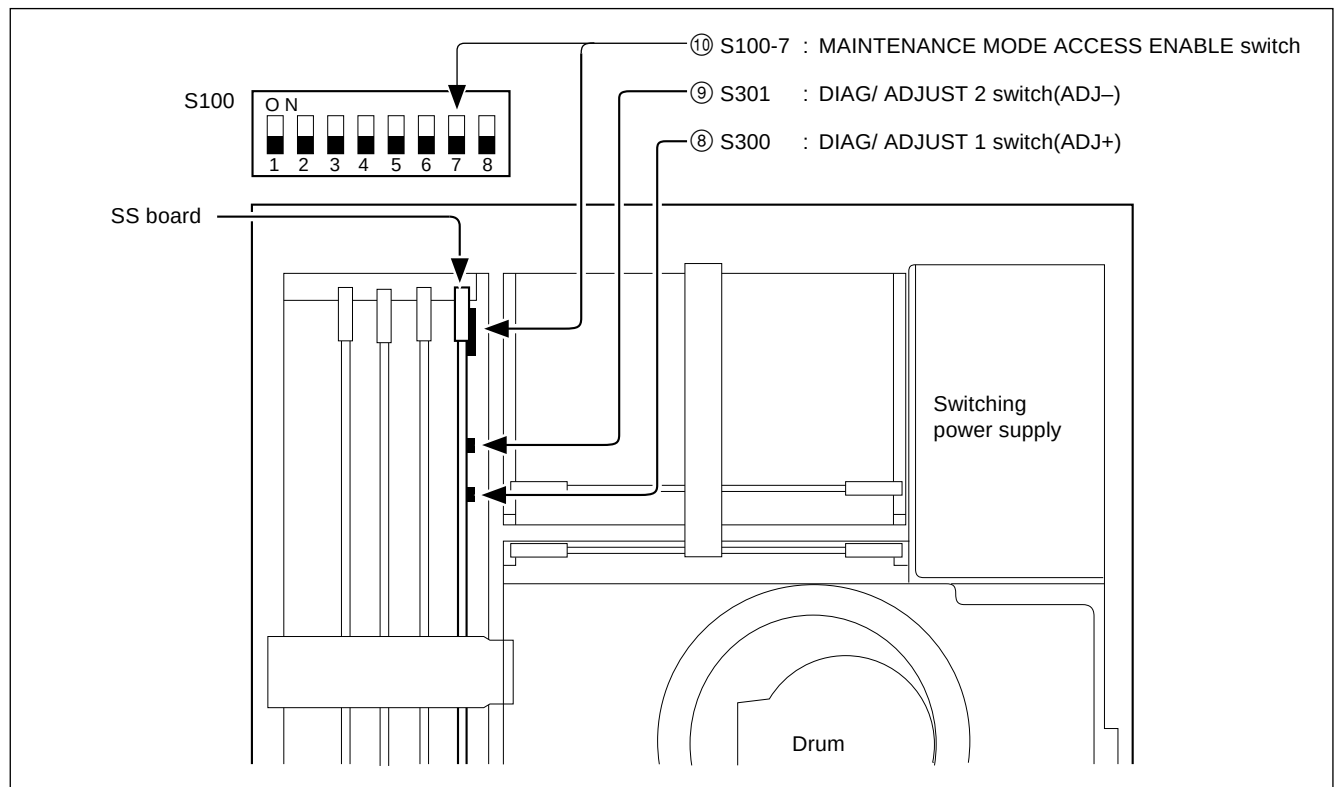
In the maintenance mode, the ② MENU button is also the same in function as this switch.

⑩ S100-7 (SS board): MAINTENANCE MODE ACCESS ENABLE switch

To enter the maintenance mode by the button operation on the front panel, set this switch to ON (upper position) in advance.



Lower Control Panel



Switch Position on SS Board

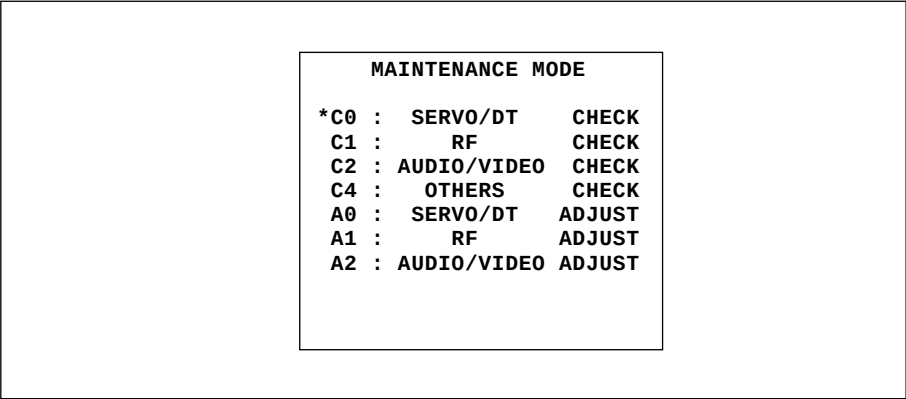
5-1-1. Operation to the Maintenance Mode

Activating the maintenance mode

- (1) Confirm that the video monitor is connected to the VIDEO OUTPUT COMPOSITE 2 connector or RF ADAPTOR VIDEO connector.
- (2) Press the ⑧ S300 (SS board).
- (3) The mode screen in the maintenance mode is displayed on the monitor screen.

Terminating the maintenance mode

- (1) Press the ② MENU button or ⑨ S301 (SS board) several times to display the mode screen.
- (2) Press the ② MENU button or ⑨ S301 (SS board) again when the mode screen is displayed. The maintenance mode is then exited.

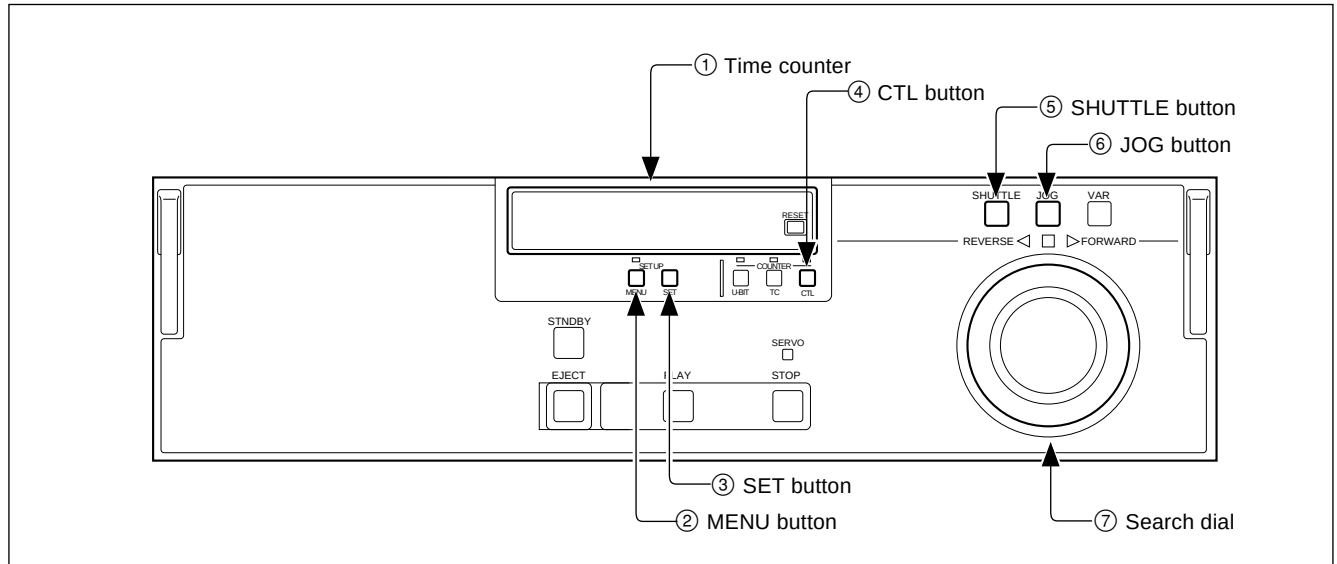


Mode Screen

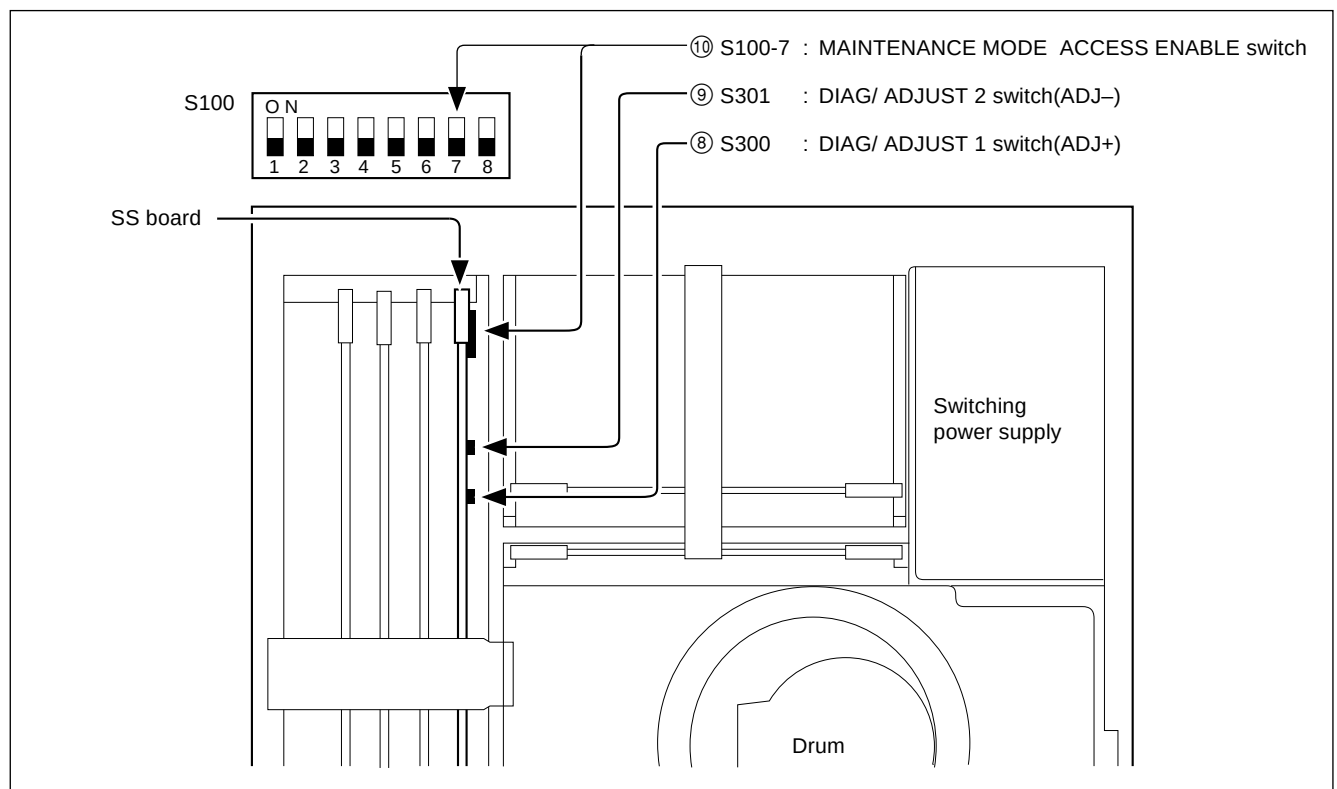
Activating the maintenance mode on lower control panel

When the ⑩S100-7 (SS board) is set to ON (upper position), the maintenance mode can be activated by the operation mentioned below.

- (1) Press the ② MENU button once.
(The mode then changes from operation mode to setup menu mode.)
- (2) Press the ③ SET button while pressing the ④ CTL button.
(The mode then changes from setup menu mode to maintenance mode.)
- (3) The mode screen in the maintenance mode is displayed on the monitor screen.

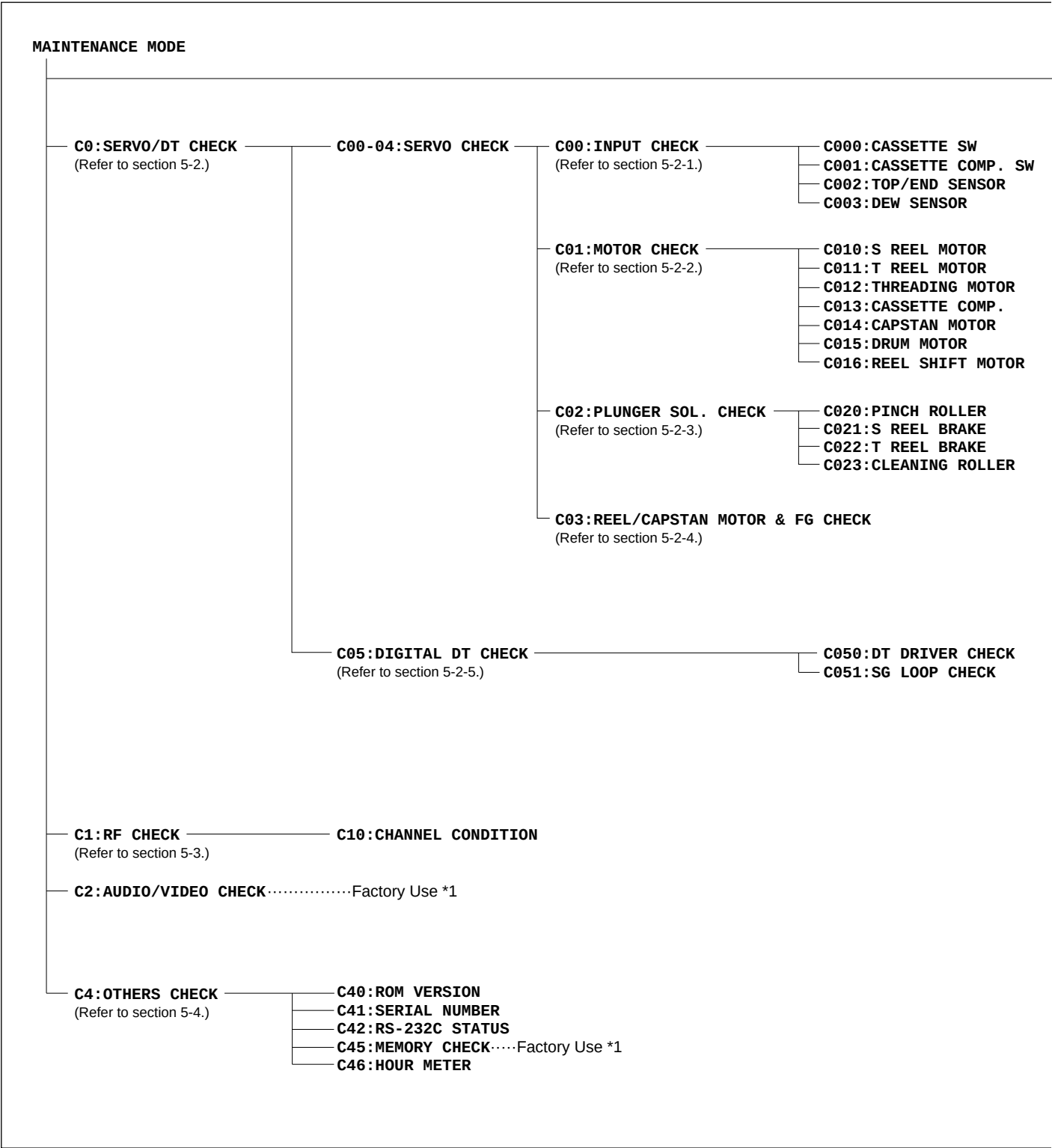


Lower Control Panel

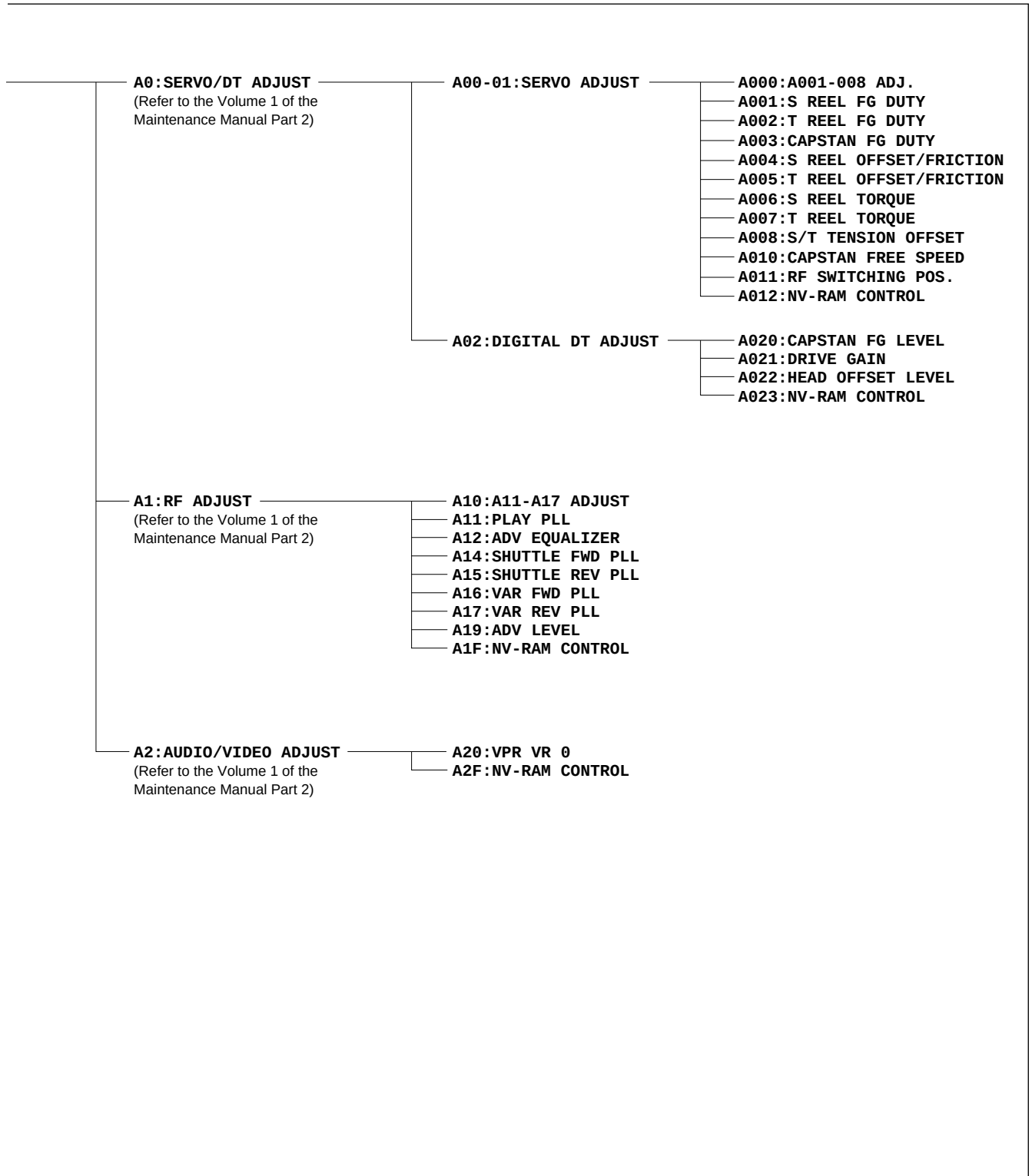


Switch Position on SS Board

5-1-2. Menu Tree



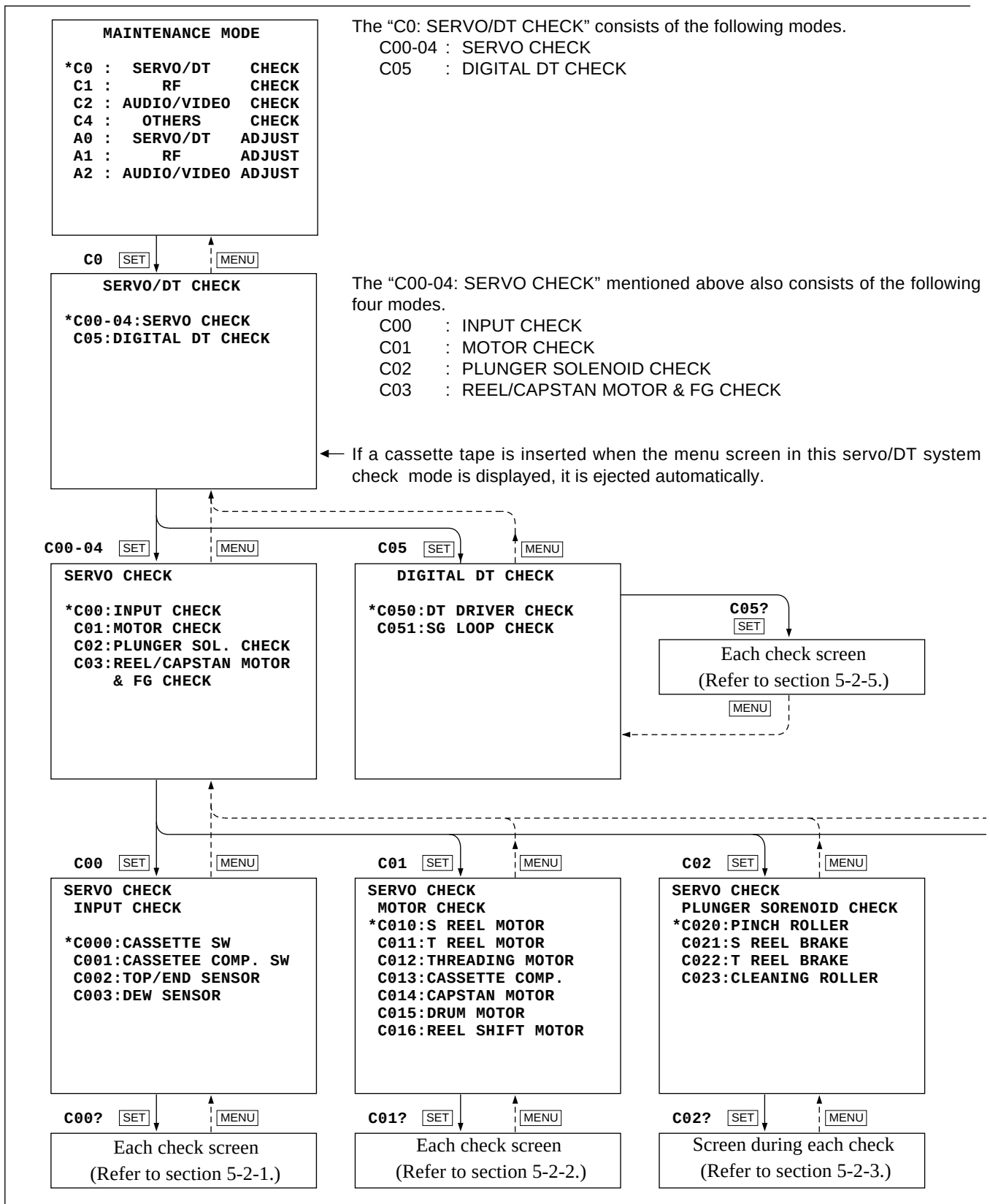
*1: These menus are intended for factory use. Never change the data.

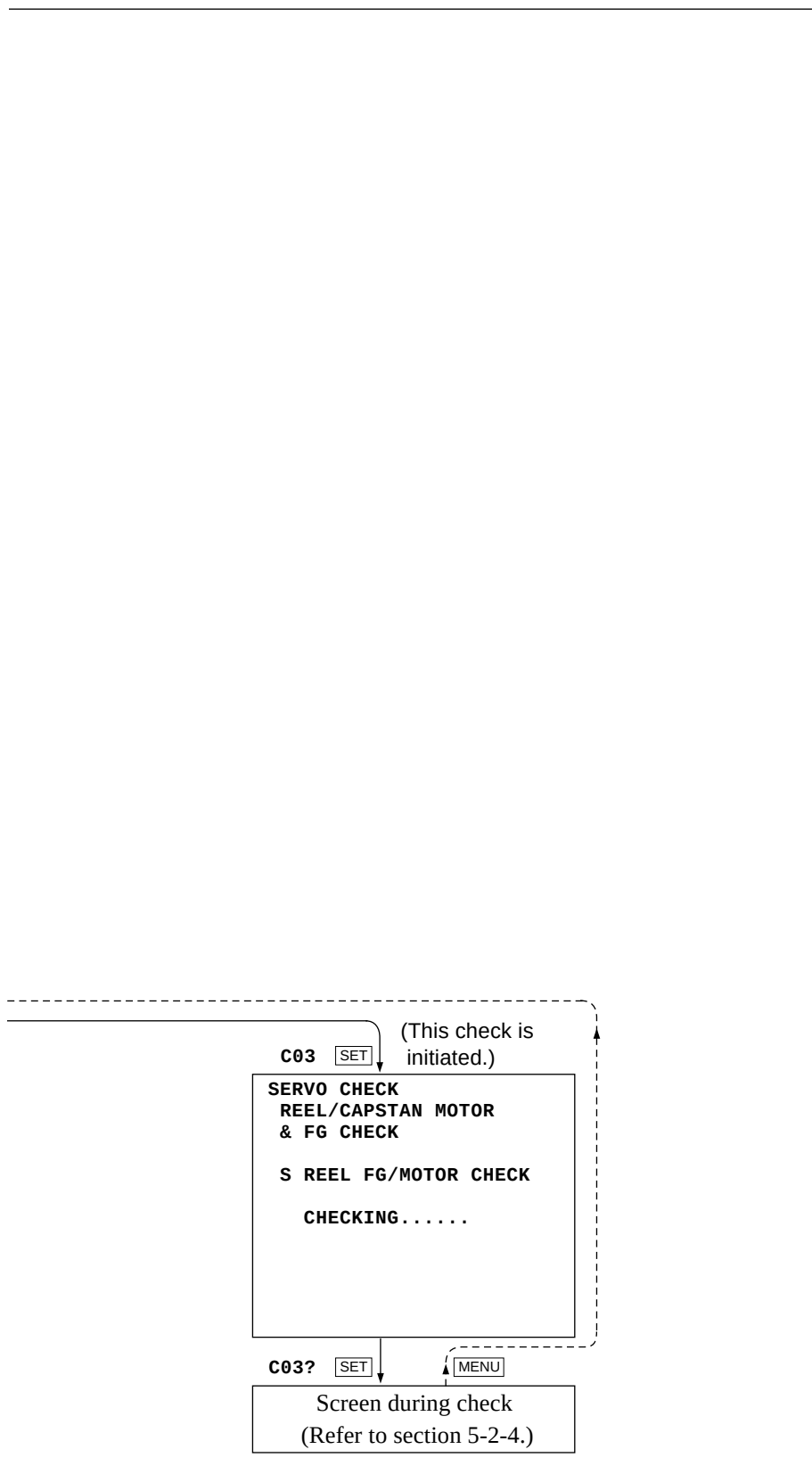


5-2. Servo/DT System Check Mode (C0: SERVO/DT CHECK)

This mode checks the servo system or DT system automatically or semiautomatically.

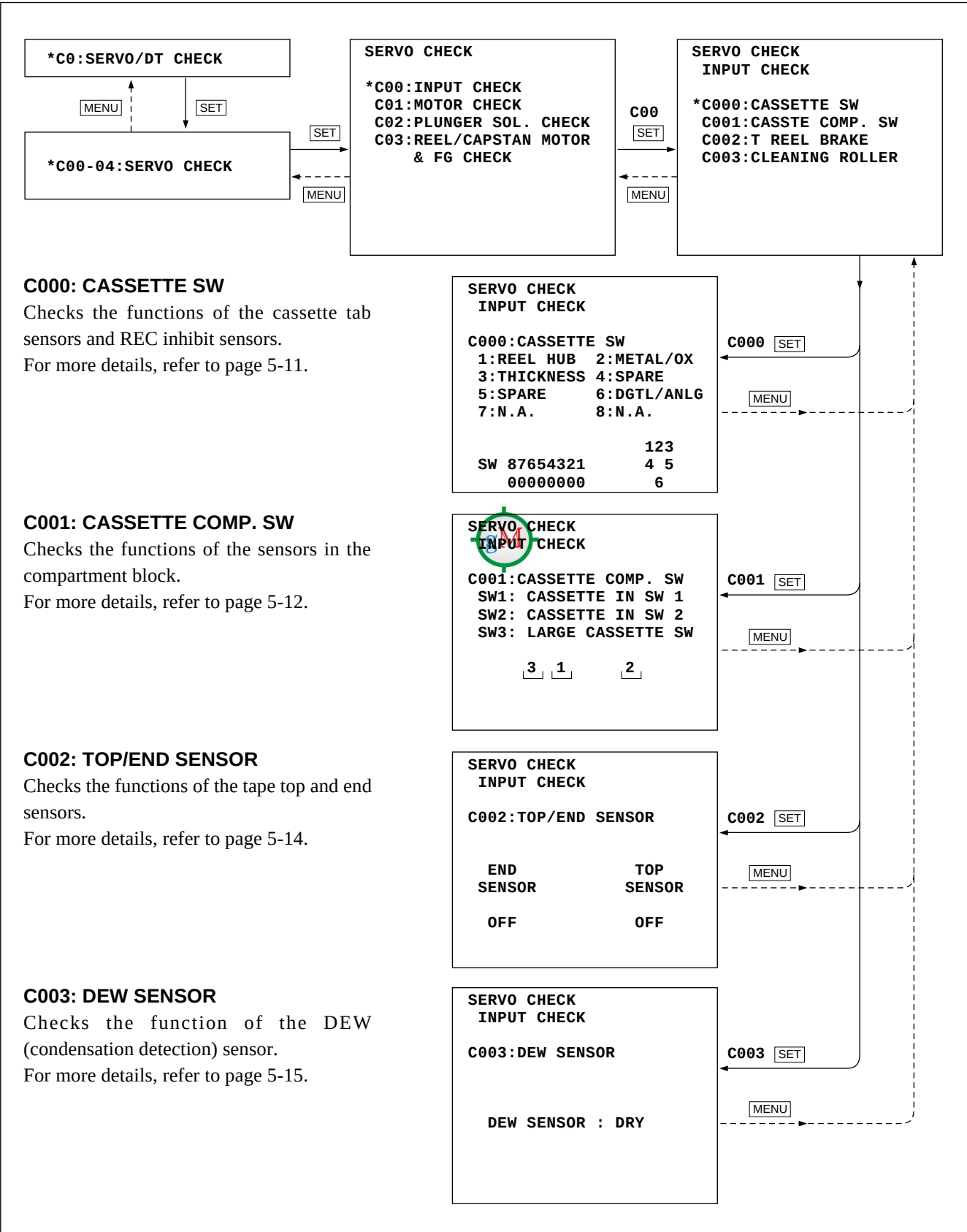
For how to activate and terminate the maintenance mode, refer to page 5-4.





5-2-1. Servo System Check 1 (C00: INPUT CHECK)

This section describes the “C00: INPUT CHECK” mode.



a) C000: CASSETTE SW

This mode checks the functions of the cassette tab sensors (switches).

Confirm that lowest digit “0” of the corresponding switch number on the monitor screen changes to “1” when switches/sensors ① through ⑥ in the figure below are pressed manually. Also confirm that the lowest digit returns from “1” to “0” when they are released.

In case of NG;

When “1” is not displayed in the specified position or when the display does not return from “1” to “0” .

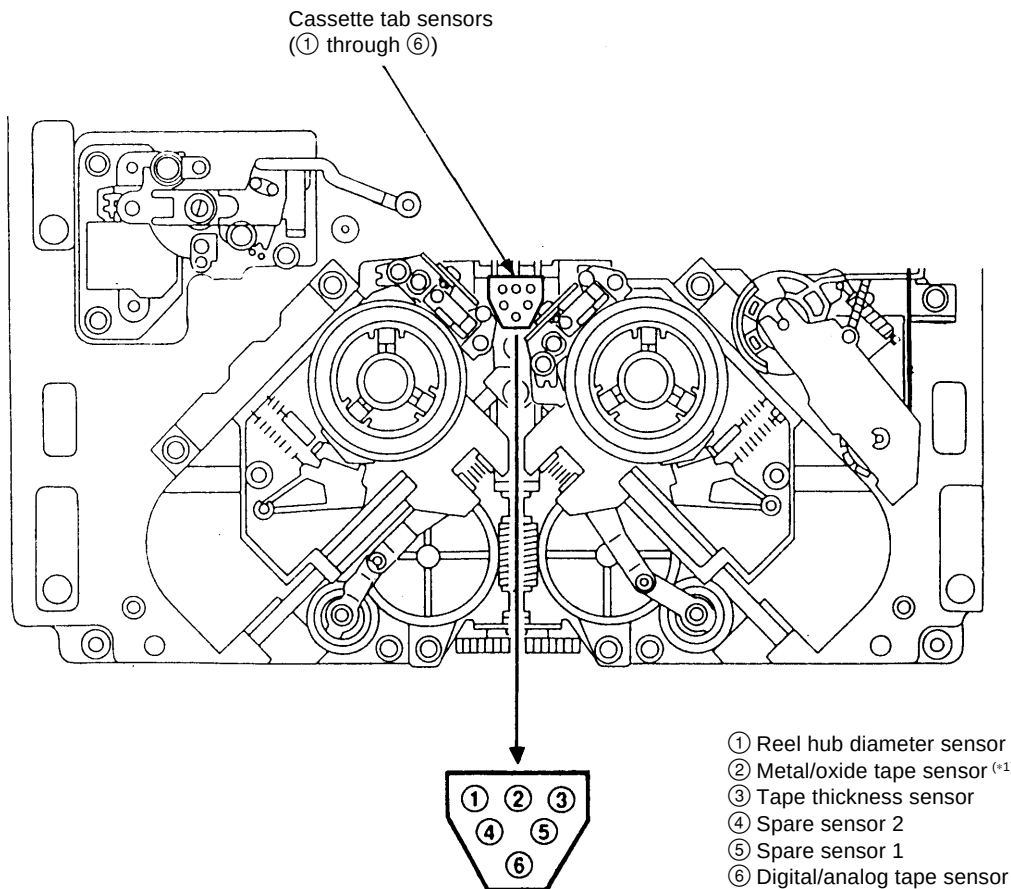
Check the corresponding sensors on the PTC-59 board.

Also check the sensor input circuit on the DR-200 board.

**SERVO CHECK
INPUT CHECK**
C000: CASSETTE SW

1: REEL HUB	2: METAL/OX
3: THICKNESS	4: SPARE
5: SPARE	6: DGTL/ANLG
7: N.A.	8: N.A.

	123
SW 87654321	4 5
00000000	6



(*1) This sensor doesn't function in this unit.

b) C001: CASSETTE COMP. SW

This mode checks the functions of the sensors (switches) in the compartment block.

Confirm that the corresponding switch number on the monitor screen changes to “ ■ ” when switches SW1 through SW3 in the figure are pressed manually. Also confirm that “ ■ ” changes to the corresponding number when they are released.

In case of NG;

When “ ■ ” is not displayed in the specified position or when the display does not return from “ ■ ” to the corresponding number.

Check the corresponding sensors on the PC-70 board.

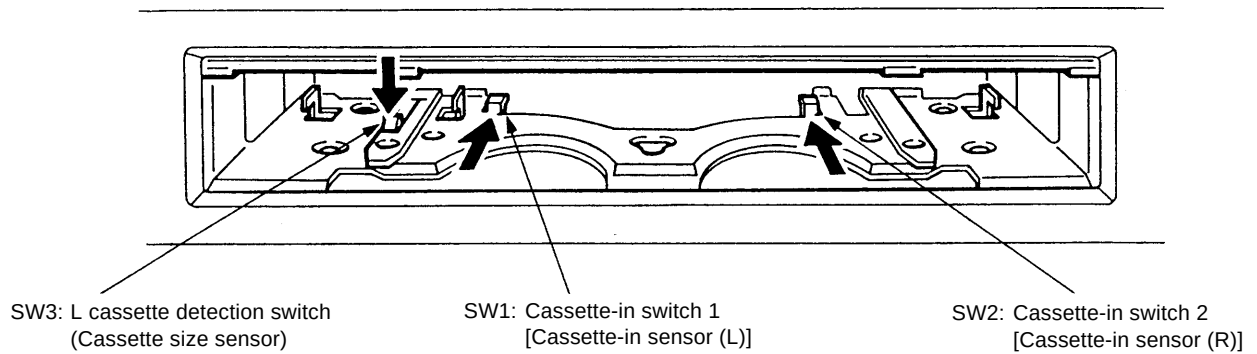
Also check the sensor input circuit on the DR-200 board.

**SERVO CHECK
INPUT CHECK**

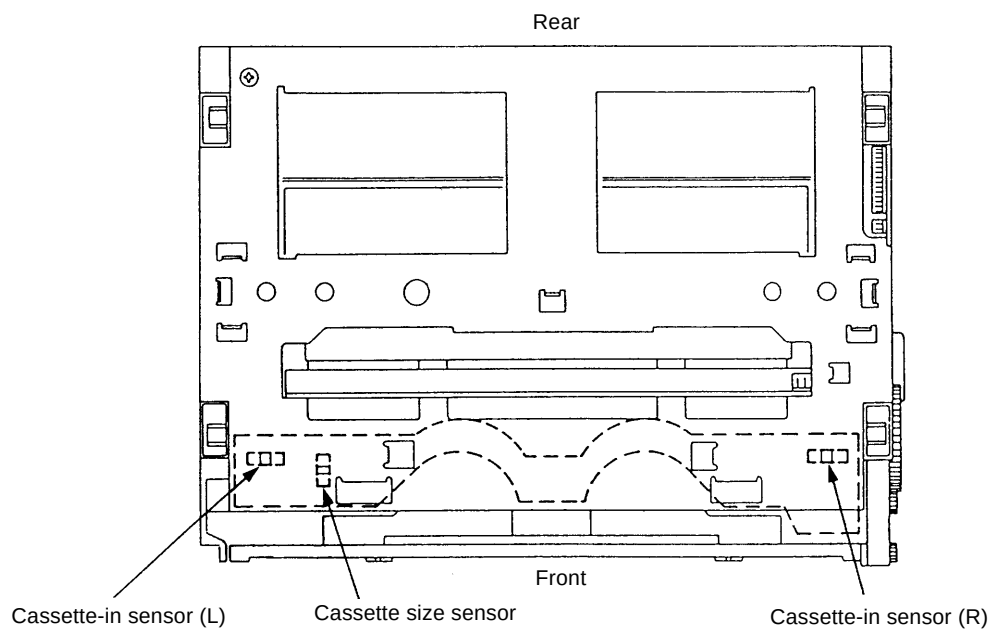
C001: CASSETTE COMP. SW
SW1: CASSETTE IN SW 1
SW2: CASSETTE IN SW 2
SW3: LARGE CASSETTE SW

3 1 2

Push the cassette window up manually.



Switch Position in Compartment Block



Top View of the Cassette Compartment

c) C002: TOP/END SENSOR

This mode checks the function of the tape top and end sensors.

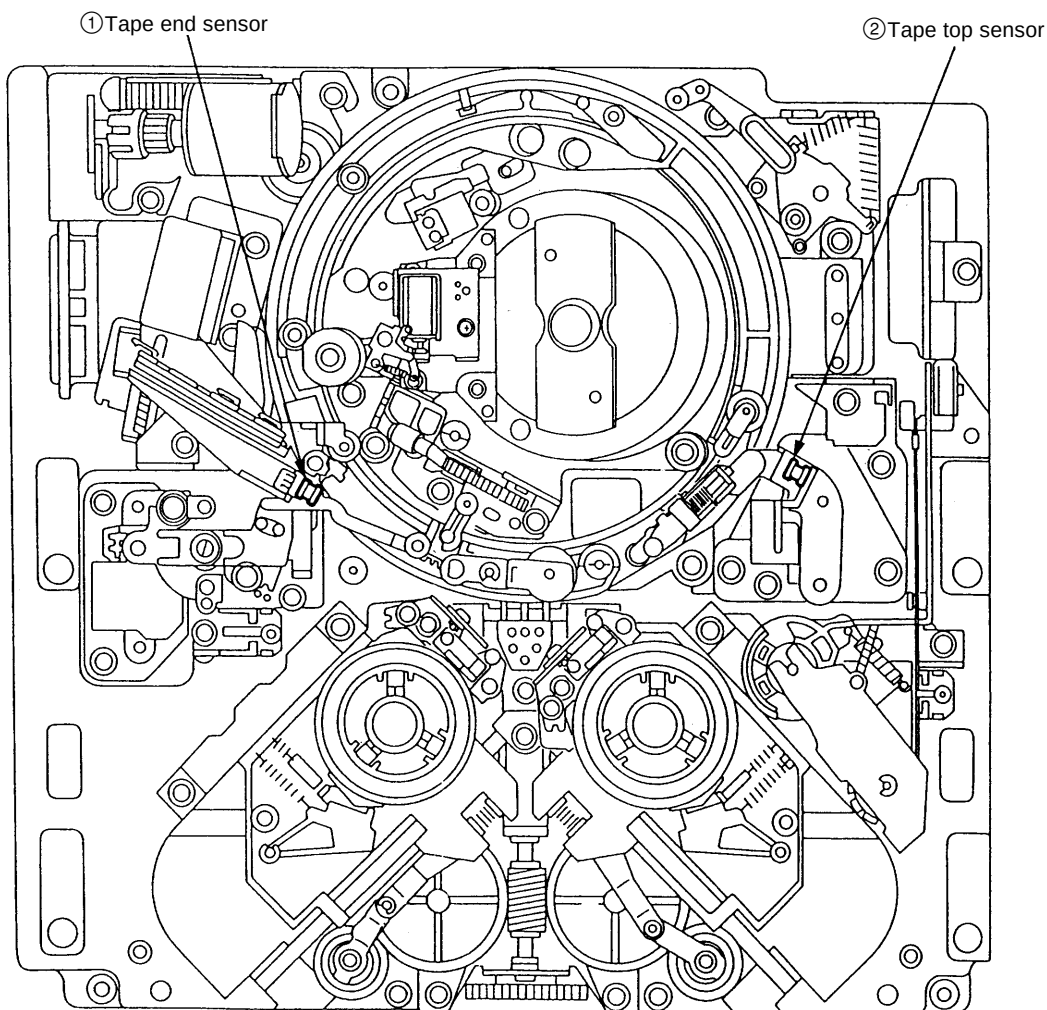
Confirm that the “OFF” display on the monitor screen changes to “ON !” when a screwdriver is brought near sensors ① and ② in the figure below. Also confirm that the display changes from “ON !” to “OFF” when the screwdriver is released from the sensors.

In case of NG;

When “ON !” is not displayed in the specified position or when the display does not return from “ON !” to “OFF”.

Check only the sensors.

Also check the sensor input circuit on the DR-200 board.

**SERVO CHECK
INPUT CHECK**
C002: TOP/END SENSOR
**END
SENSOR**
OFF
**TOP
SENSOR**
OFF


d) C003: DEW SENSOR

This mode checks the function of the DEW (condensation detection) sensor.

- (1) Confirm that the “DRY” display on the monitor screen changes to “WET !” when the sensor is slightly touched with a cotton swab moistened with water.
- (2) Wipe the sensor with a dry cotton swab to eliminate water. Confirm that the display on the monitor screen returns from “WET !” to “DRY” when a wind is blown against the sensor using a blower to evaporate moisture.

**SERVO CHECK
INPUT CHECK**

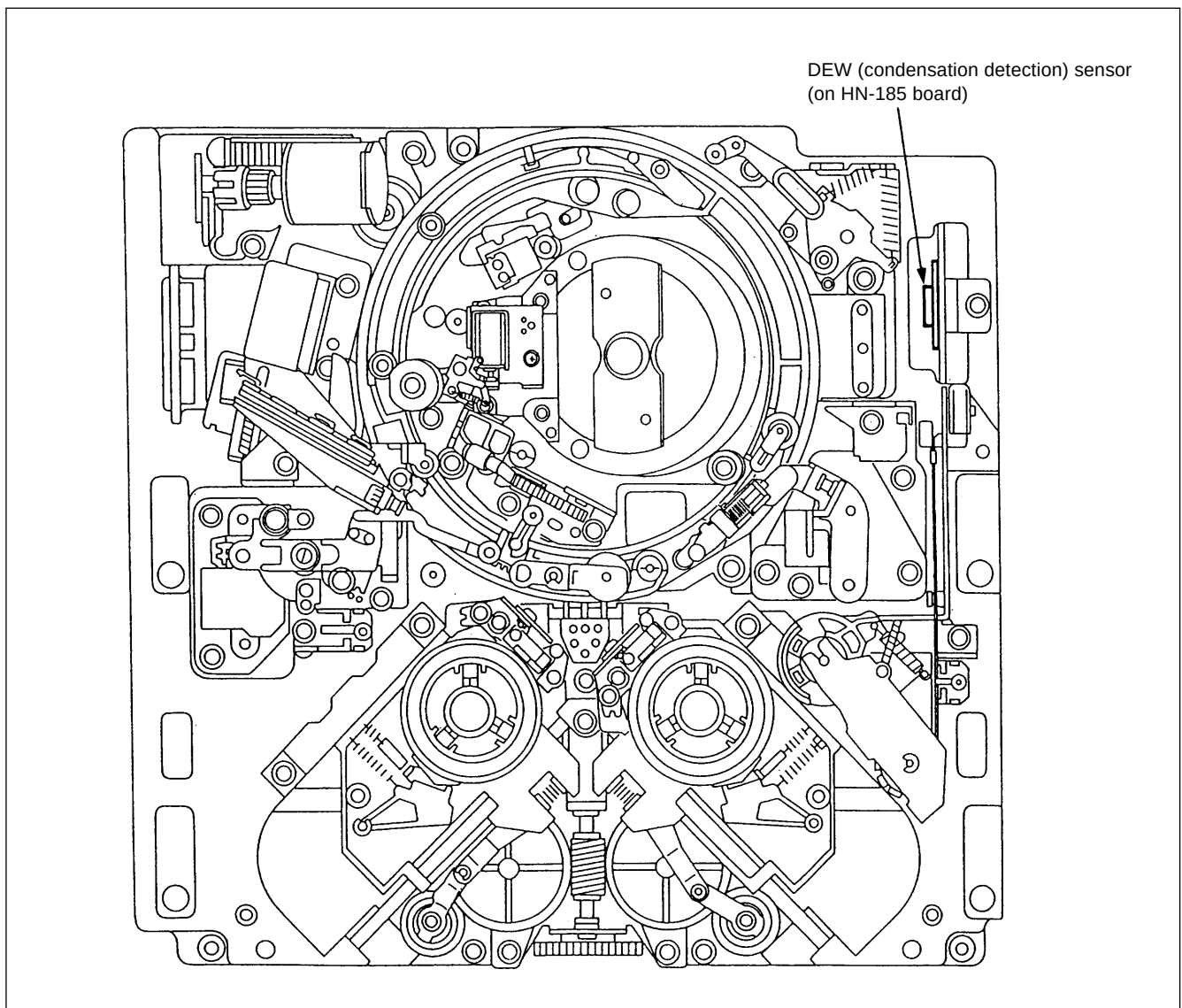
C003:DEW SENSOR

DEW SENSOR : DRY

In case of NG;

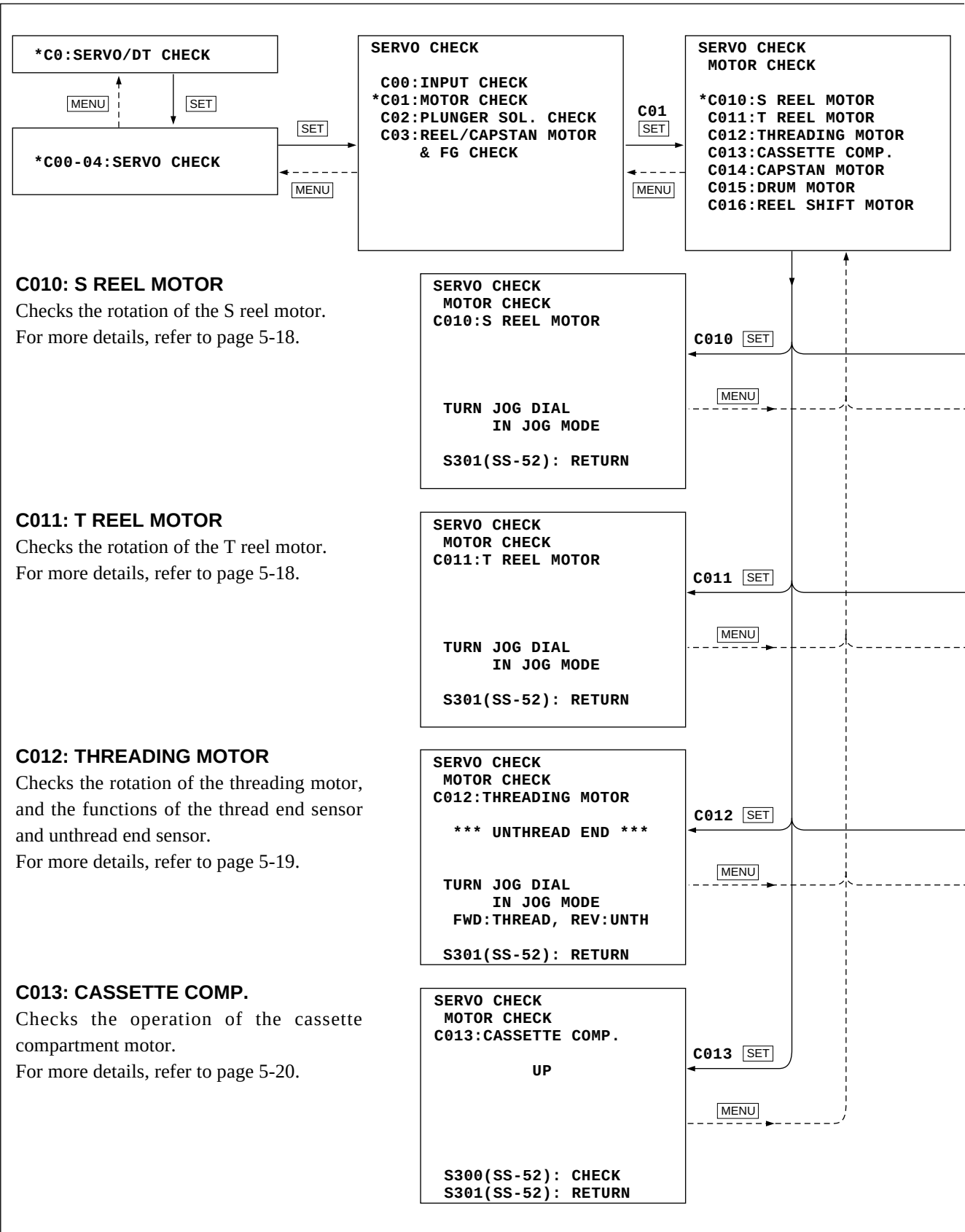
When the display does not change from “DRY” to “WET !” even if the sensor is moistened.

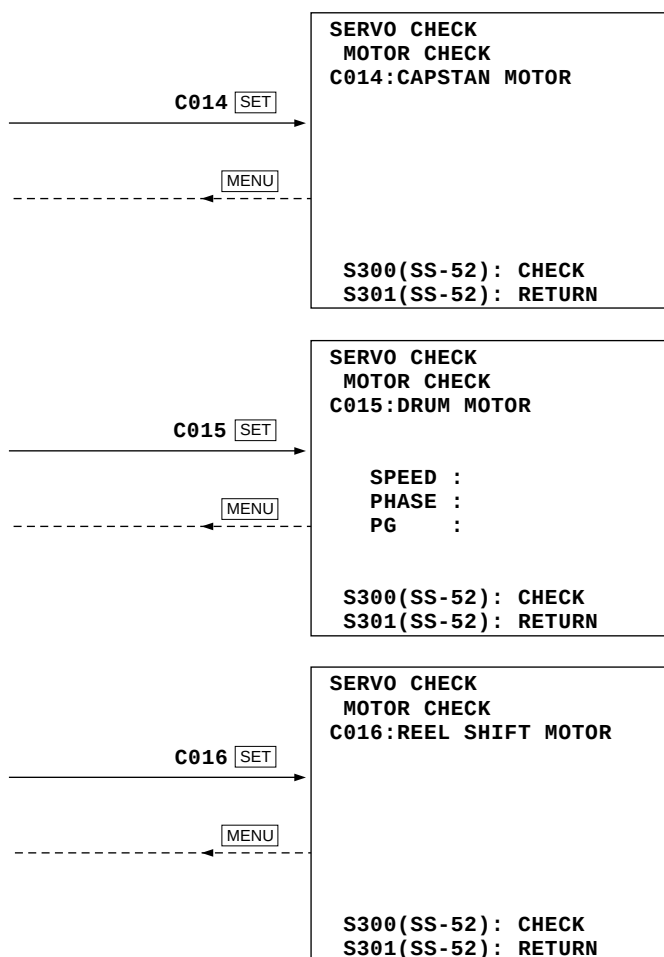
Check only the sensor.



5-2-2. Servo System Check 2 (C01: MOTOR CHECK)

This section describes the “C01: MOTOR CHECK” mode.



**C014: CAPSTAN MOTOR**

Checks the rotation direction of the capstan motor.
For more details, refer to page 5-21.

C015: DRUM MOTOR

Checks the rotation of the drum motor.
For more details, refer to page 5-21.

C016: REEL SHIFT MOTOR

Checks the operation of the reel shift motor, and the
function of the reel position sensor.
For more details, refer to page 5-22.

a) C010: S REEL MOTOR

This mode checks the rotation of the S reel motor.

Turn the S reel motor using a search dial (JOG mode).

Dial	Rotation direction of the S reel motor
FWD	FORWARD (↻)
REV	REVERSE (↻)

Confirm that the S reel motor rotates in the direction specified by the dial after the S brake solenoid is turned on and after the S reel brake is released.

In case of NG;

When the ON operation sound of the S brake solenoid is not generated or when the S reel motor does not rotate in the direction specified by the dial.

Check the S reel motor driver circuit (DR-200 board).

SERV0 CHECK
MOTOR CHECK
C010:S REEL MOTOR

**TURN JOG DIAL
IN JOG MODE**

S301(SS-52): RETURN

b) C011: T REEL MOTOR

This mode checks the rotation of the T reel motor.

Turn the T reel motor using a search dial (JOG mode).

Dial	Rotation direction of the T reel motor
FWD	FORWARD (↻)
REV	REVERSE (↻)

Confirm that the T reel motor rotates in the direction specified by the dial after the T brake solenoid is turned on and after the T reel brake is released.

In case of NG;

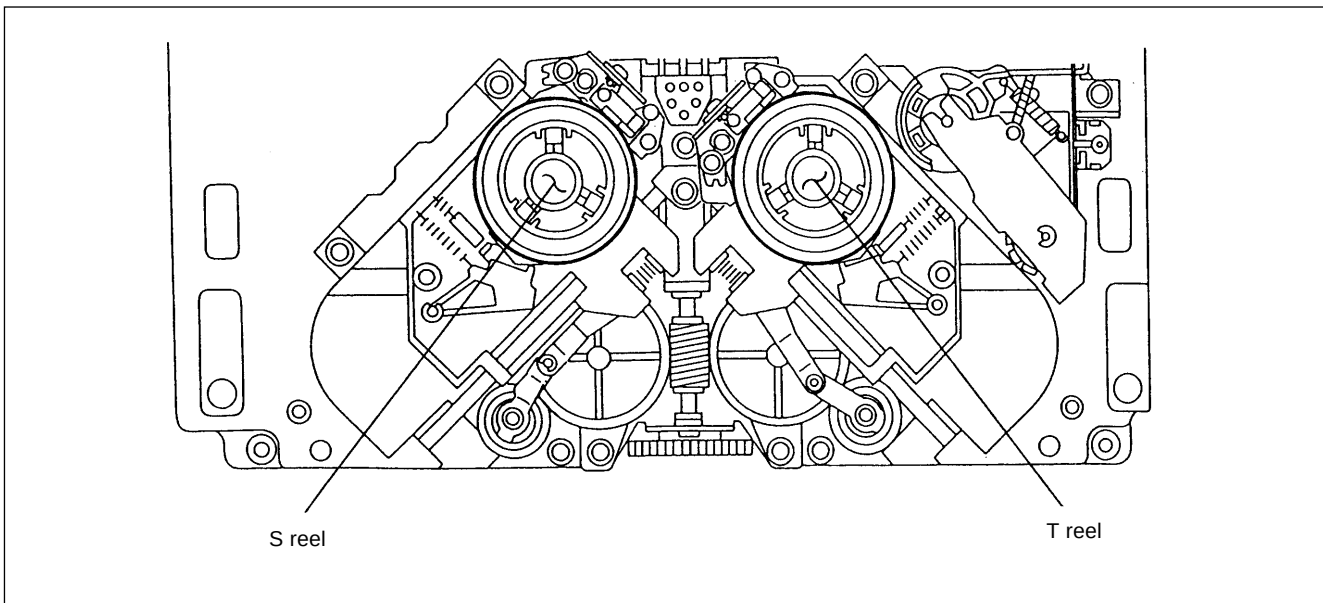
When the ON operation sound of the T brake solenoid is not generated or when the T reel motor does not rotate in the direction specified by the dial.

Check the T reel motor driver circuit (DR-200 board).

SERVO CHECK
MOTOR CHECK
C011:T REEL MOTOR

**TURN JOG DIAL
IN JOG MODE**

S301(SS-52): RETURN



c) C012: THREADING MOTOR

This mode checks the rotation of the threading motor, and the functions of the thread end sensor and unthread end sensor.

Turn the threading motor using a search dial (JOG mode). As a result, the thread ring moves as shown in the table below.

Dial	Movement of the threading ring
FWD	Threading
REV	Unthreading

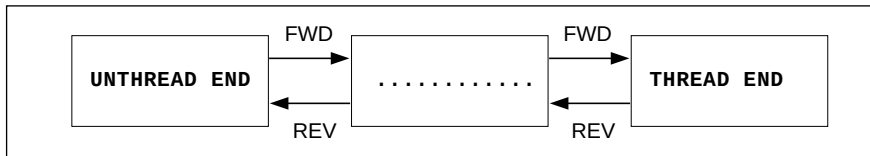
**SERVO CHECK
MOTOR CHECK
C012:THREADING MOTOR**

***** UNTHREAD END *****

**TURN JOG DIAL
IN JOG MODE
FWD:THREAD, REV:UNTH**

S301(SS-52): RETURN

Confirm that the display on the monitor screen changes as shown below.



Threading Motor Check

In case of NG;

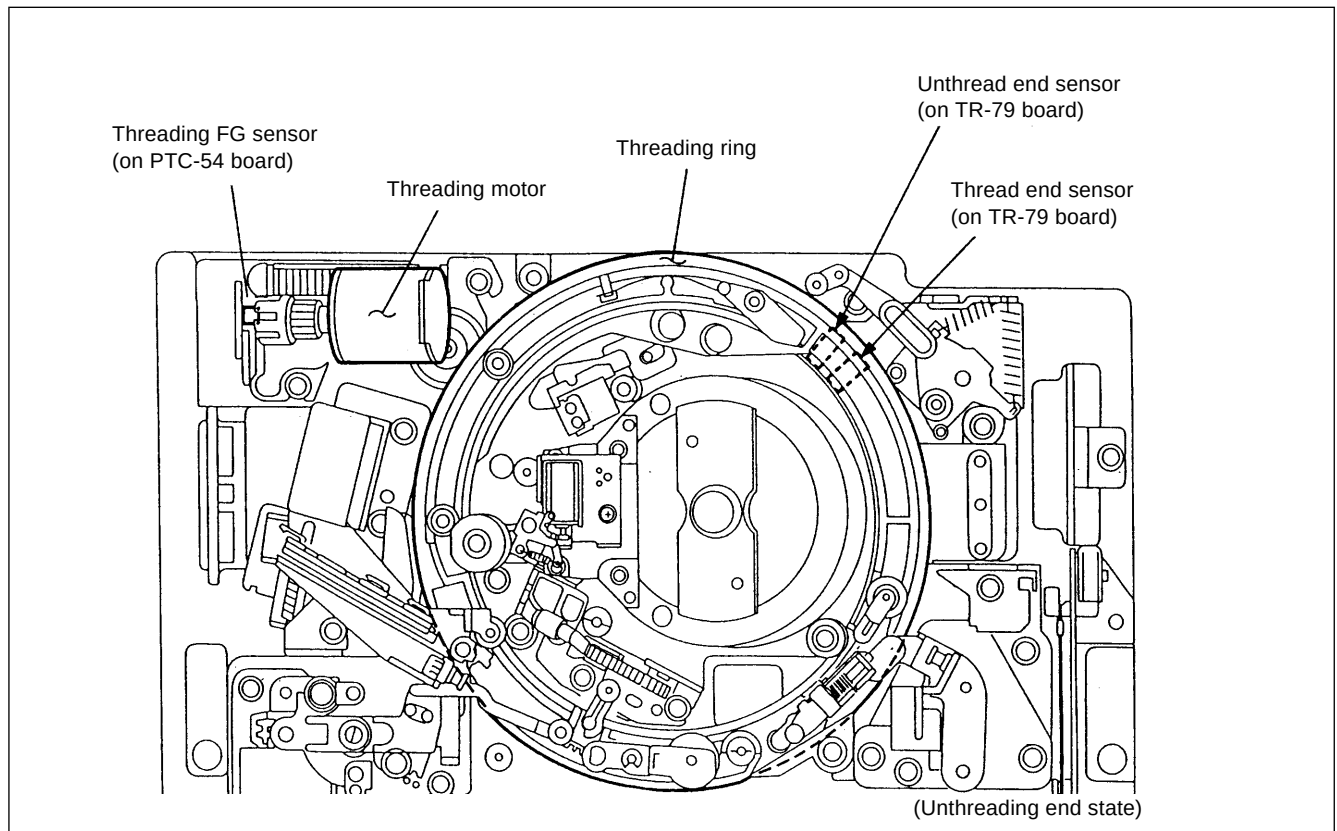
When the threading motor does not rotate.

Check the threading motor and the FG sensor on the PTC-59 board.

Also check the threading motor driver circuit (DR-200 board) and the threading FG amplifier circuit (DR-200 board).

When the display remains “.....” with the unit set to the thread end/unthread end state.

Check the thread end sensor and unthread end sensor on the TR-79 board.



d) C013: CASSETTE COMP.

This mode checks the operation of the cassette compartment motor, and the function of the cassette down sensor.

- (1) Press the SET button (or switch S300 on the SS board).
Confirm that the compartment block goes down. At that time, confirm that the display on the monitor screen changes as shown below.

UP → HORIZ. → VERT. → DOWN

- (2) Press the SET button (or switch S300 on the SS board) again.
Confirm that the compartment block goes up. At that time, confirm that the display on the monitor screen changes as shown below.

DOWN → VERT. → HORIZ. → UP

**SERVO CHECK
MOTOR CHECK
C013: CASSETTE COMP.**

UP

**S300(SS-52): CHECK
S301(SS-52): RETURN**

In case of NG;

When the cassette compartment motor does not rotate.

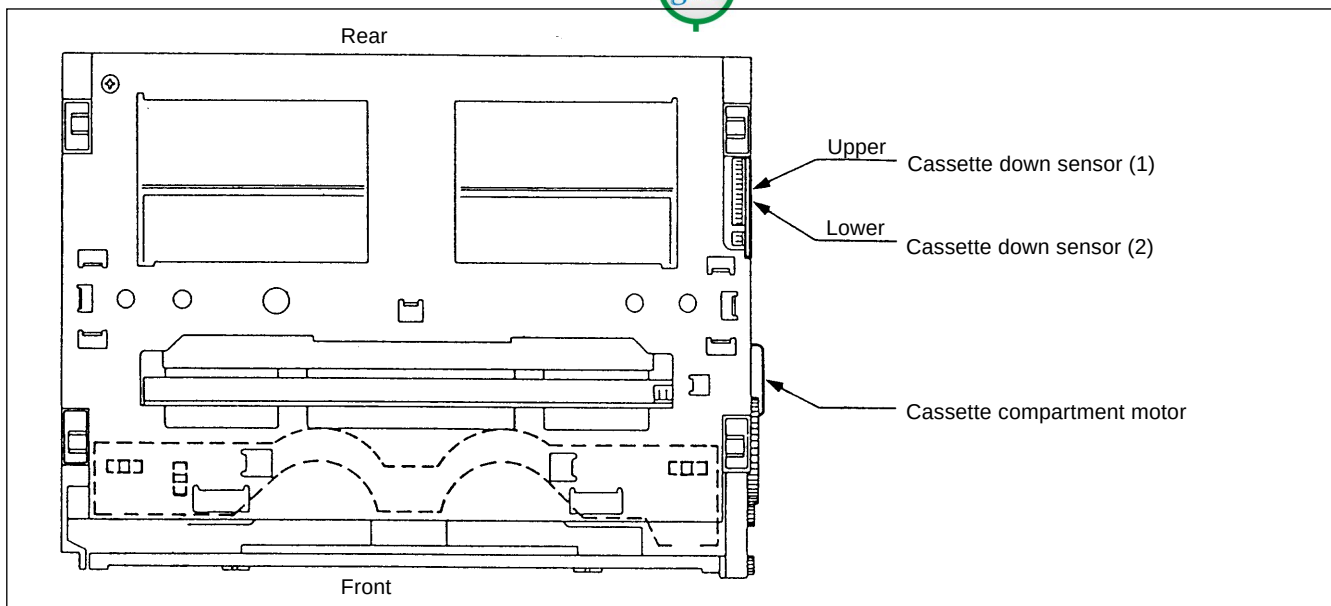
Check the cassette compartment motor.

Also check the cassette compartment motor driver circuit (DR-200 board).

When the compartment block goes up and down normally, but the display does not change.

Check the cassette down sensor.

Also check the sensor input circuit on the DR-200 board.



Top View of the Cassette Compartment

e) C014: CAPSTAN MOTOR

This mode checks the rotation direction of the capstan motor.

- (1) Press the SET button (or switch S300 on the SS board).
Confirm that the capstan motor rotates in the forward direction (↻) and that the “FORWARD OK” display appears on the monitor screen.
- (2) Press the SET button (or switch S300 on the SS board) again.
Confirm that the capstan motor rotates in the reverse direction (↺) and that the “REVERSE OK” display appears on the monitor screen.

In case of NG;

When the capstan motor does not rotate.

Check the capstan motor.

Also check capstan motor driver circuit (DR-200 board).

When the capstan motor rotates normally, but the “OK” display does not appear on the monitor screen.

Check the capstan motor.

Also check the capstan FG amplifier input circuit (DR-200 board).

f) C015: DRUM MOTOR

This mode checks the rotation of the drum motor.

- (1) Press the SET button (or switch S300 on the SS board) to initiate this check.
The display on the monitor screen at that time is as shown below.

SPEED : NG
PHASE : UNLOCK
PG : NO EXIST

- (2) Confirm that the display on the monitor screen changes as shown at right after a little while.

In case of NG;

When the display on the monitor screen does not change.

Check the drum motor driver circuit (DR-200 board), the drum FG amplifier circuit (DR-200 board), and the drum PG amplifier circuit (DR-200 board).

**SERVO CHECK
MOTOR CHECK
C014:CAPSTAN MOTOR**

**S300(SS-52): CHECK
S301(SS-52): RETURN**

**SERVO CHECK
MOTOR CHECK
C015:DRUM MOTOR**

**SPEED :
PHASE :
PG :**

**S300(SS-52): CHECK
S301(SS-52): RETURN**

SET or **S300**

**SERVO CHECK
MOTOR CHECK
C015:DRUM MOTOR**

**SPEED : OK
PHASE : LOCK
PG : EXIST**

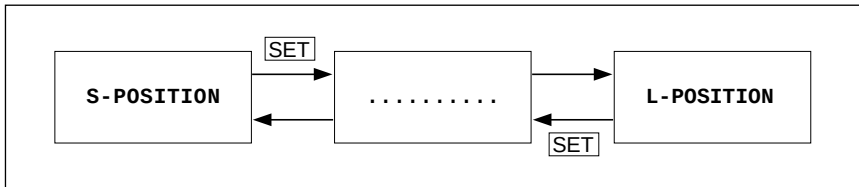
**S300(SS-52): CHECK
S301(SS-52): RETURN**

Check completed (OK)

g) C016: REEL SHIFT MOTOR

This mode checks the operation of the reel shift motor, and the function of the reel position sensor.

Confirm that the reel table moves from the S position to the L position (from the L position to the S position) when the SET button (or switch S300 on the SS board) is pressed. Also confirm that the display on the monitor screen changes as shown below.



**SERVO CHECK
MOTOR CHECK
C016: REEL SHIFT MOTOR**

S-POSITION

**S300(SS-52): CHECK
S301(SS-52): RETURN**

In case of NG;

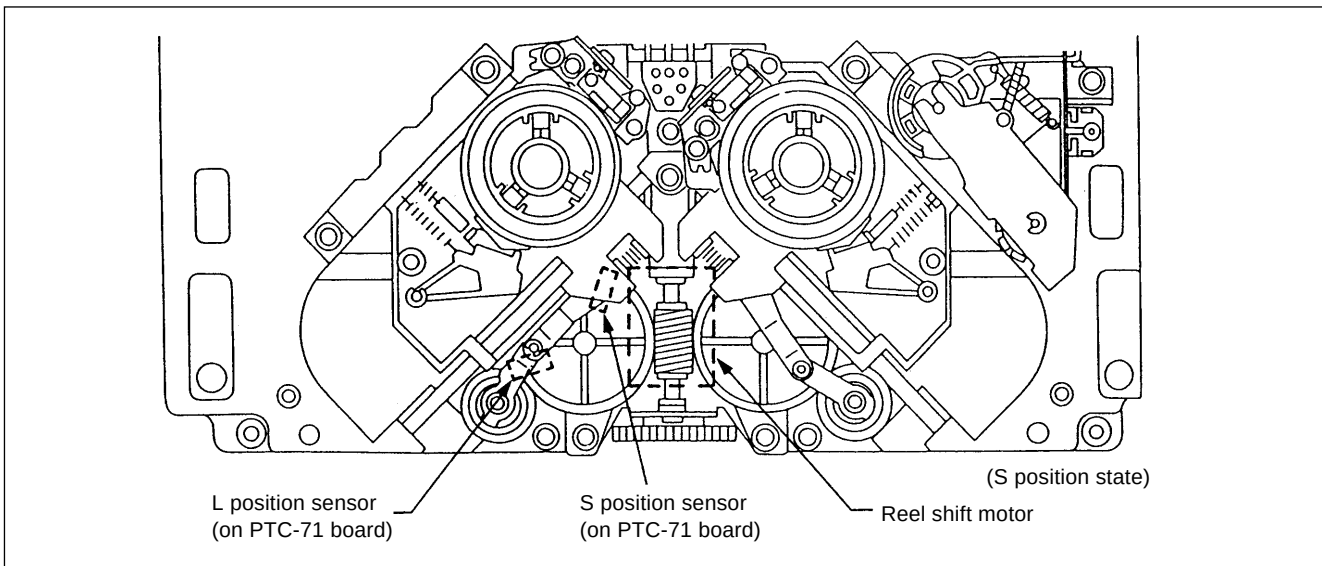
When the reel shift motor does not rotate.

Check the reel shift motor.

Also check the reel shift motor driver circuit (DR-200 board).

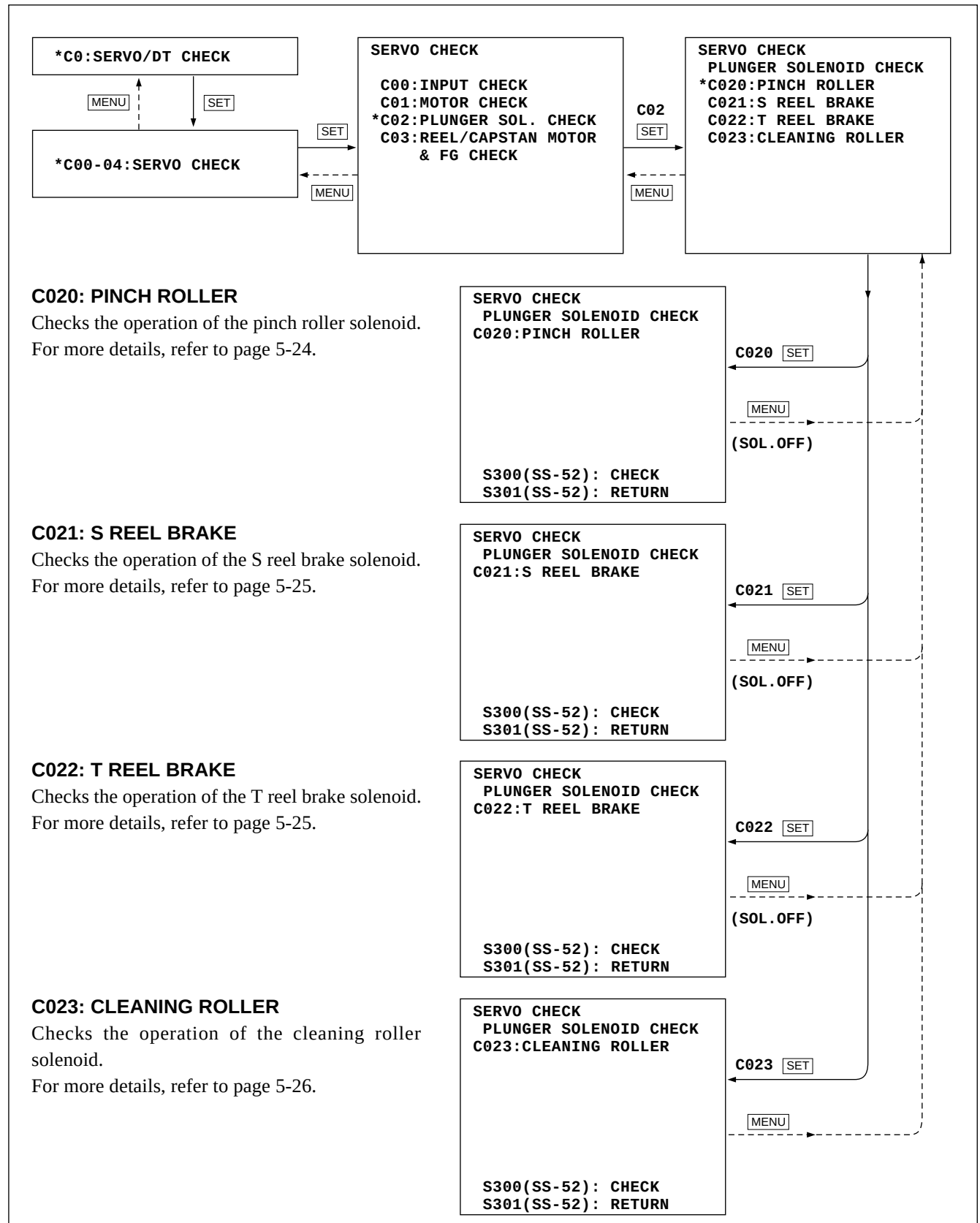
When the display remains “.....” with the reel table moved to the L position or S position.

Check the L position/S position sensor (PTC-71 board).



5-2-3. Servo System Check 3 (C02: PLUNGER SOLENOID CHECK)

This section describes the “C02: PLUNGER SOLENOID CHECK” mode.



a) C020: PINCH ROLLER

This mode checks the operation of the pinch roller solenoid.

- (1) Press the SET button (or switch S300 on the SS board).
Confirm by the generation of a sound that the pinch solenoid is turned on.
- (2) Press the MENU button (or switch S301 on the SS board).
The drive voltage of the pinch solenoid is then turned off.
The monitor screen returns to the submenu.
- (3) Push the pinch lever slightly in the direction of the pinch solenoid with
fingers. The core of the pinch solenoid then returns to the former position.

**SERVO CHECK
PLUNGER SOLENOID CHECK
C020:PINCH ROLLER**

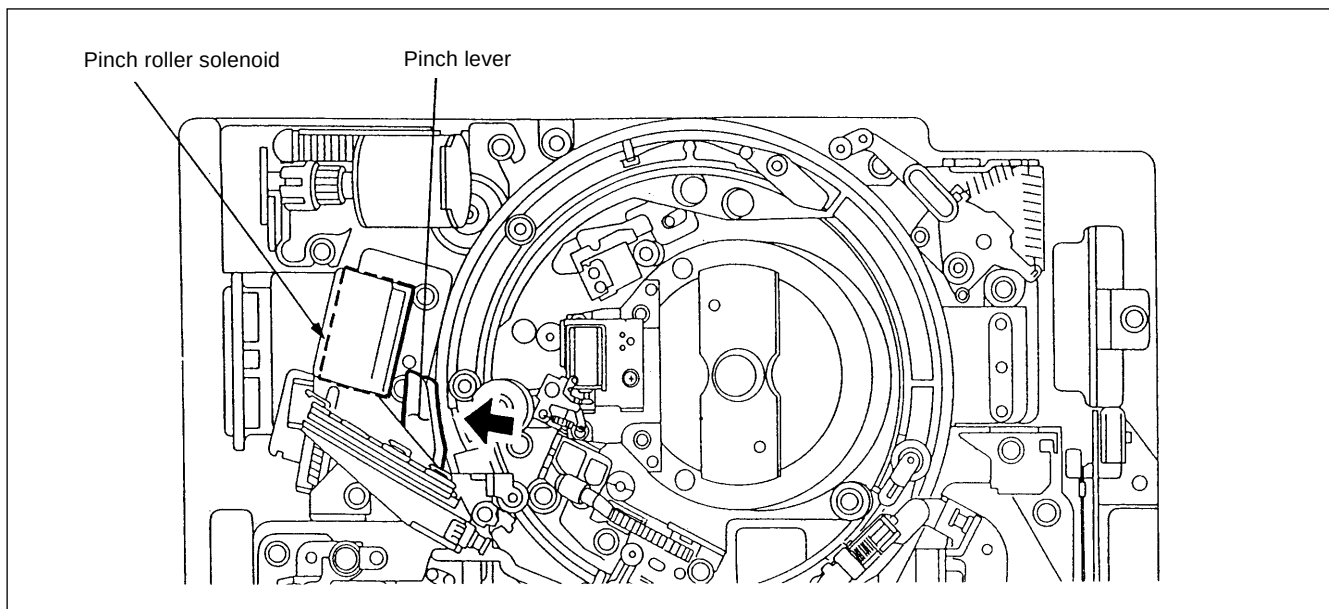
**S300(SS-52): CHECK
S301(SS-52): RETURN**

In case of NG;

When the sound indicating that the pinch solenoid is turned on is not generated or
when the monitor screen does not change.

Check the pinch solenoid.

Also check the solenoid driver circuit on the DR-200 board.



b) C021: S REEL BRAKE

This mode checks the operation of the S reel brake solenoid.

- (1) Press the SET button (or switch S300 on the SS board).
Confirm by the generation of a sound that the S reel brake solenoid is turned on.
- (2) Press the MENU button (or switch S301 on the SS board).
The core of the S reel brake solenoid then returns to the former position.
The monitor screen returns to the submenu.

**SERVO CHECK
PLUNGER SOLENOID CHECK
C021:S REEL BRAKE**

**S300(SS-52): CHECK
S301(SS-52): RETURN**

In case of NG;

When the sound indicating that the S reel brake solenoid is turned on is not generated or when the monitor screen does not change.

Check the S reel brake solenoid.

Also check the solenoid driver circuit on the DR-200 board.

c) C022: T REEL BRAKE

This mode checks the operation of the T reel brake solenoid.

- (1) Press the SET button (or switch S300 on the SS board).
Confirm by the generation of a sound that the T reel brake solenoid is turned on.
- (2) Press the MENU button (or switch S301 on the SS board).
The core of the T reel brake solenoid then returns to the former position.
The monitor screen returns to the submenu.

**SERVO CHECK
PLUNGER SOLENOID CHECK
C022:T REEL BRAKE**

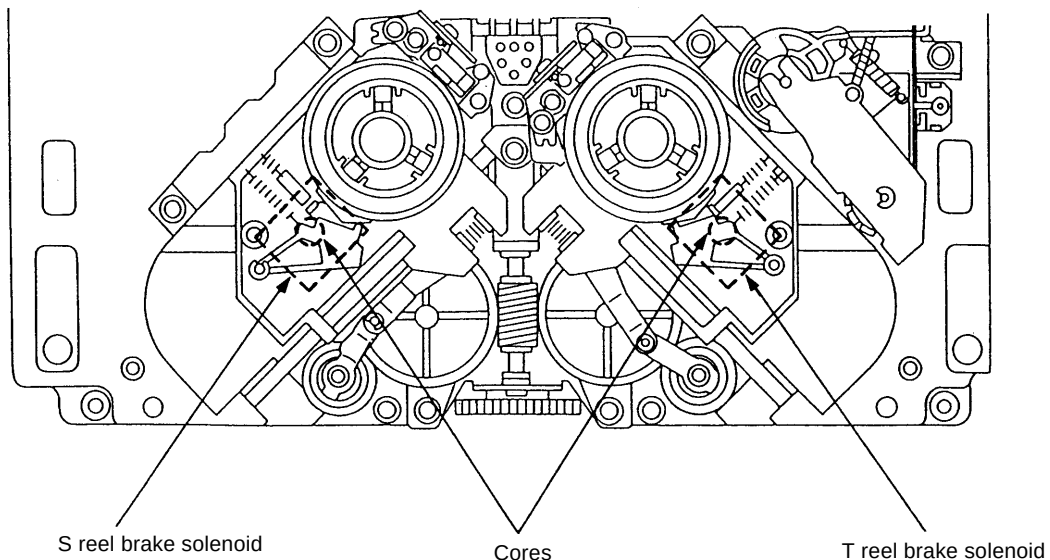
**S300(SS-52): CHECK
S301(SS-52): RETURN**

In case of NG;

When the sound indicating that the T reel brake solenoid is turned on is not generated or when the monitor screen does not change.

Check the T reel brake solenoid.

Also check the solenoid driver circuit on the DR-200 board.



d) C023: CLEANING ROLLER

This mode checks the operation of the cleaning roller solenoid.

- (1) Press the SET button (or switch S300 on the SS board).
Confirm that the cleaning roller solenoid is activated, the cleaning roller touches the drum, and it is immediately released from the drum.
- (2) Press the MENU button (or switch S301 on the SS board).
The monitor screen returns to the submenu.

SERVO CHECK
PLUNGER SOLENOID CHECK
C023: CLEANING ROLLER

S300(SS-52) : CHECK
S301(SS-52) : RETURN

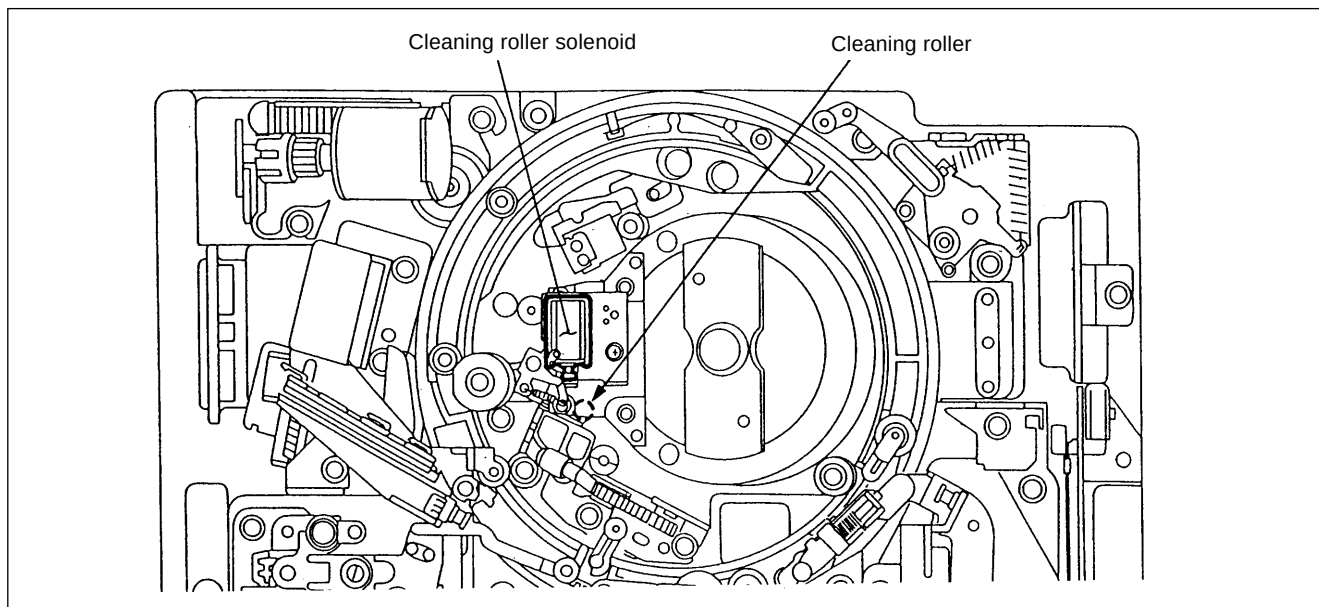
Note: The cleaning roller solenoid is burned when it continuously remains on. If the cleaning roller solenoid is not released from the drum, turn the power of this unit off as soon as possible.

In case of NG;

When the cleaning roller dose not touch the drum or it is not release from the drum.

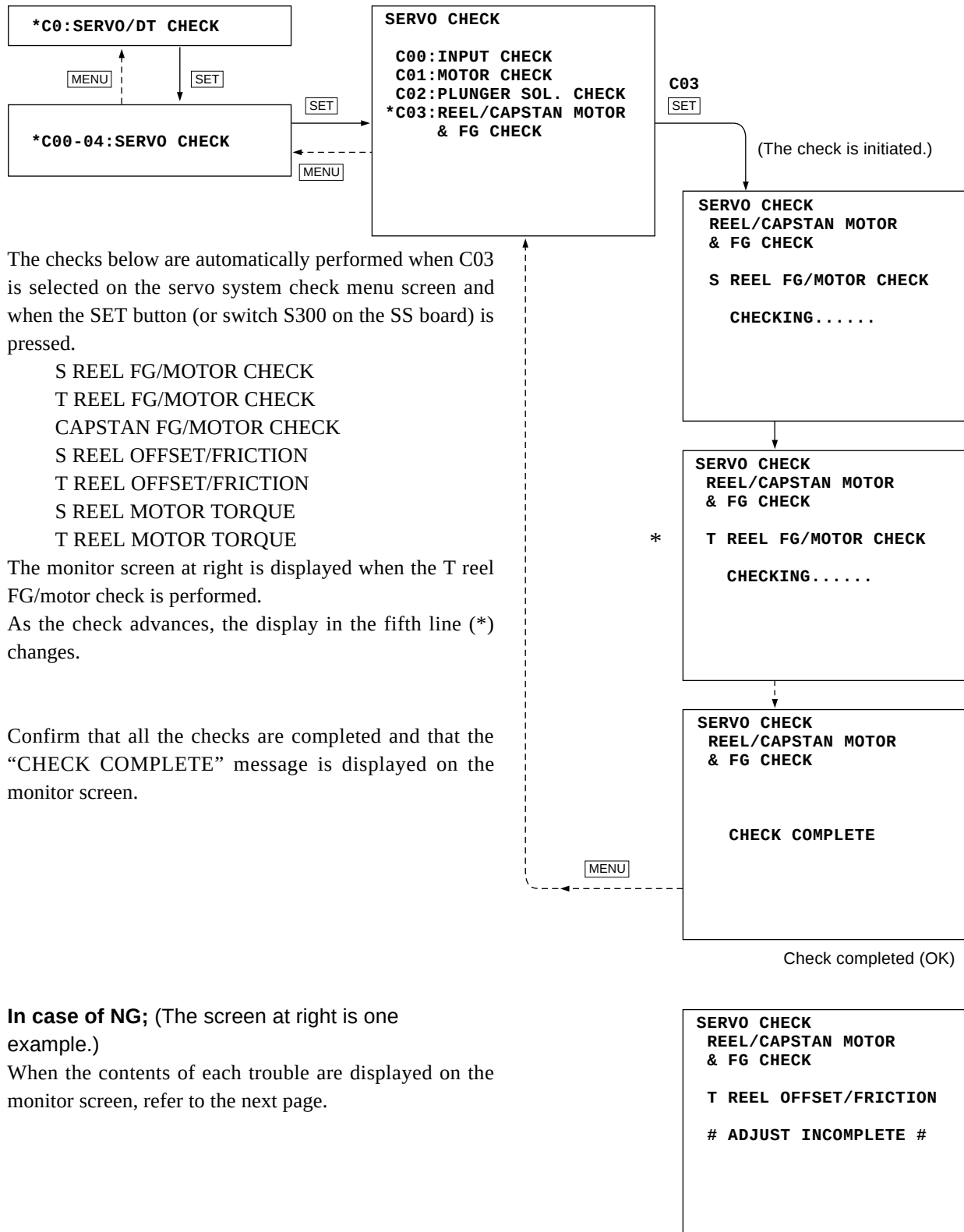
Check the cleaning roller solenoid.

Also check the solenoid driver circuit on the DR-200 board.



5-2-4. Servo System Check 4 (C03: REEL/CAPSTAN MOTOR & FG CHECK)

This section describes the “C03: REEL/CAPSTAN MOTOR & FG CHECK” mode.



a) S REEL FG/MOTOR CHECK

Checks the duty cycle of the S reel FG.

In case of NG;

Check the S reel motor (C010: S REEL MOTOR).

If no abnormality is found, adjust the duty cycle of the S reel FG (A001: S REEL FG DUTY).

b) T REEL FG/MOTOR CHECK

Checks the duty cycle of the T reel FG.

In case of NG;

Check the T reel motor (C011: T REEL MOTOR).

If no abnormality is found, adjust the duty cycle of the T reel FG (A002: T REEL FG DUTY).

c) CAPSTAN FG/MOTOR CHECK

Checks the duty cycle of the capstan FG.

In case of NG;

Check the capstan motor (C014: CAPSTAN MOTOR).

If no abnormality is found, adjust the duty cycle of the capstan FG (A003: CAPSTAN FG DUTY).

d) S REEL OFFSET/FRICTION

Checks the offset and friction levels of the S reel.

In case of NG;

Check the S reel motor (C010: S REEL MOTOR).

If no abnormality is found, adjust the offset and friction of the S reel (A004: S REEL OFFSET/FRIC).

e) T REEL OFFSET/FRICTION

Checks the offset and friction levels of the T reel.

In case of NG;

Check the T reel motor (C011: T REEL MOTOR).

If no abnormality is found, adjust the offset and friction of the T reel (A005: T REEL OFFSET/FRIC).

f) S REEL MOTOR TORQUE

Checks the torque of the S reel.

In case of NG;

Check the S reel motor (C010: S REEL MOTOR).

If no abnormality is found, adjust the torque of the S reel (A006: S REEL TORQUE).

g) T REEL MOTOR TORQUE

Checks the torque of the T reel.

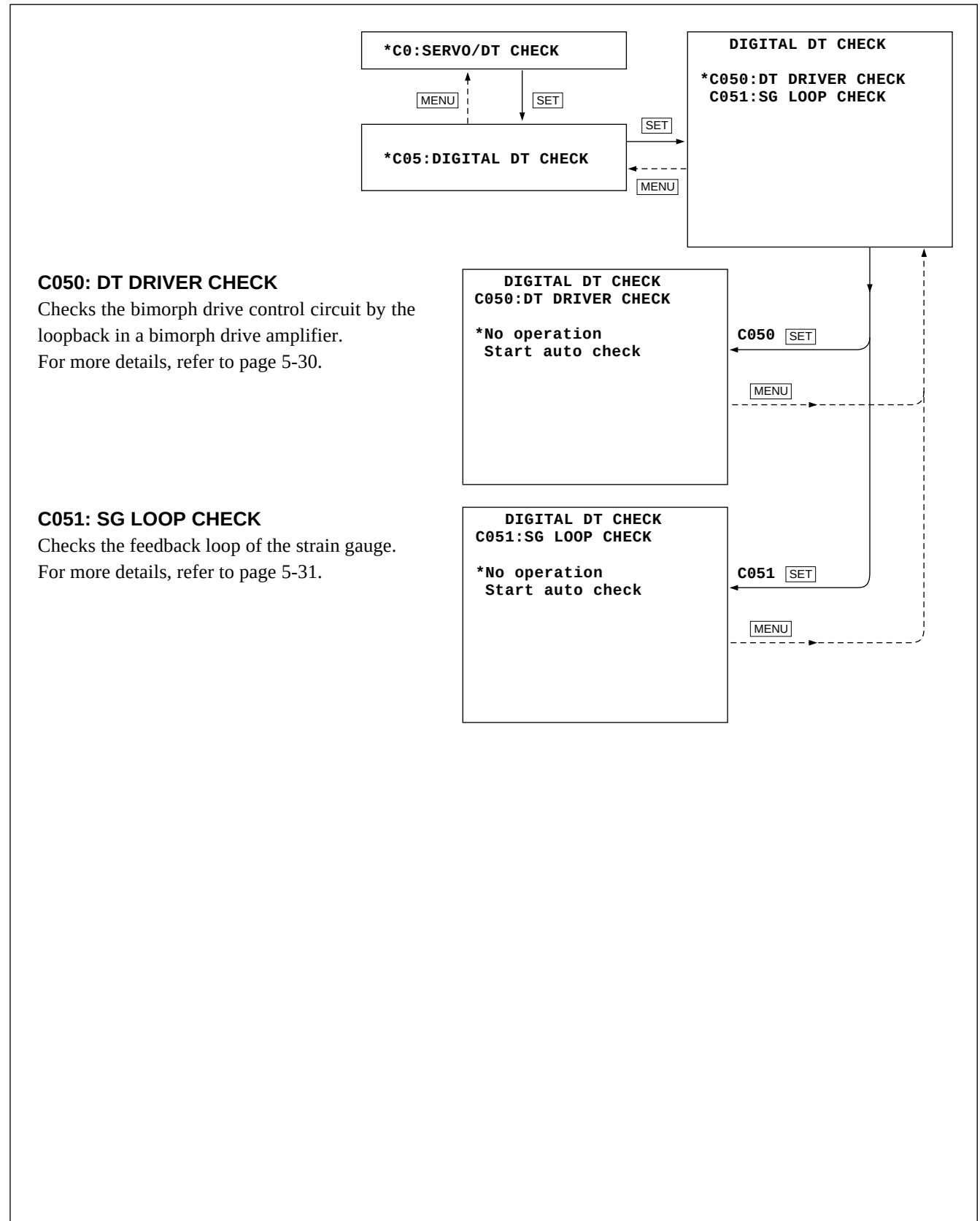
In case of NG;

Check the T reel motor (C011: T REEL MOTOR).

If no abnormality is found, adjust the torque of the T reel (A007: T REEL TORQUE).

5-2-5. Digital DT System Check (C05: DIGITAL DT CHECK)

This section describes the “C05: DIGITAL DT CHECK” mode.



a) C050: DT DRIVER CHECK

This mode checks the bimorph drive control circuit (on the SS board) by the loopback in a bimorph drive amplifier (on the DT-34B board).

(1) Set the “*” mark to “Start auto check” using a search dial (JOG mode).

(2) When the SET button (or switch S300 on the SS board) is pressed after the “Push SET button” message is displayed, this check is initiated.

(3) Confirm that the check is completed and that the “CHECK COMPLETE” message is displayed on the monitor screen.



DIGITAL DT CHECK
C050:DT DRIVER CHECK
 *No operation
 Start auto check

(1) DIAL
 (2) **SET** or **S300**

DIGITAL DT CHECK
C050:DT DRIVER CHECK
 No operation
 *Start auto check
 CHECKING.....

During check

DIGITAL DT CHECK
C050:DT DRIVER CHECK
 No operation
 *Start auto check
 CHECK COMPLETE

Check completed (OK)

In case of NG; (The screen at right is one example.)

When the “CHECK COMPLETE” message is not displayed on the monitor screen.

Check bimorph drive amplifier (DT-34B board) and slip ring.

Also check the bimorph drive control circuit (SS board).

DIGITAL DT CHECK
C050:DT DRIVER CHECK
 No operation
 *Start auto check
 # CHECK INCOMPLETE #
 A/Bch

Check completed (NG)

b) C051: SG LOOP CHECK

This mode checks the feedback loop of the strain gauge.

(1) Set the “*” mark to “Start auto check” using a search dial (JOG mode).

(2) When the SET button (or switch S300 on the SS board) is pressed after the “Push SET button” message is displayed, this check is initiated.

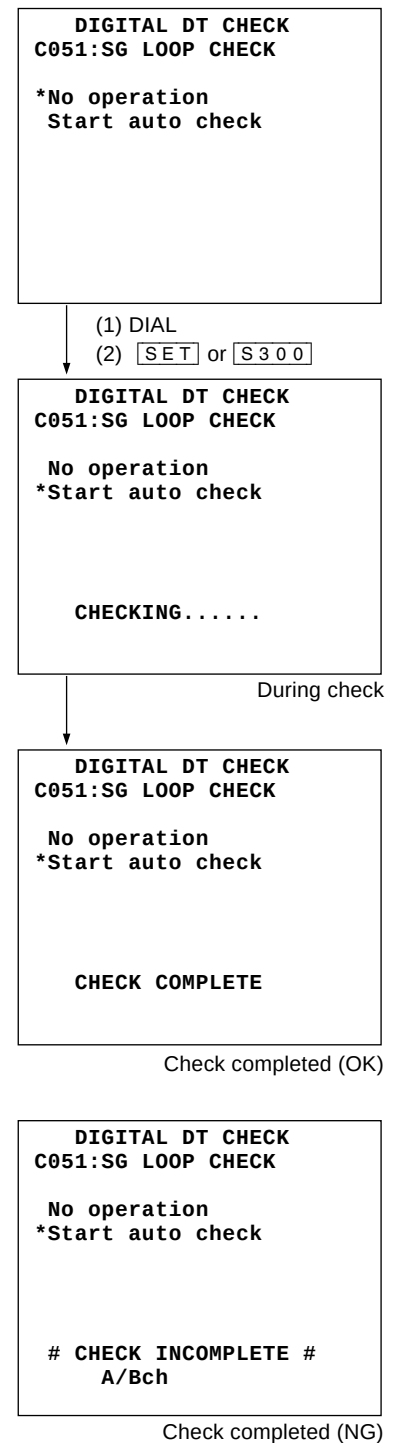
(3) Confirm that the check is completed and that the “CHECK COMPLETE” message is displayed on the monitor screen.

In case of NG; (The screen at right is one example.)

When the “CHECK COMPLETE” message is not displayed on the monitor screen.

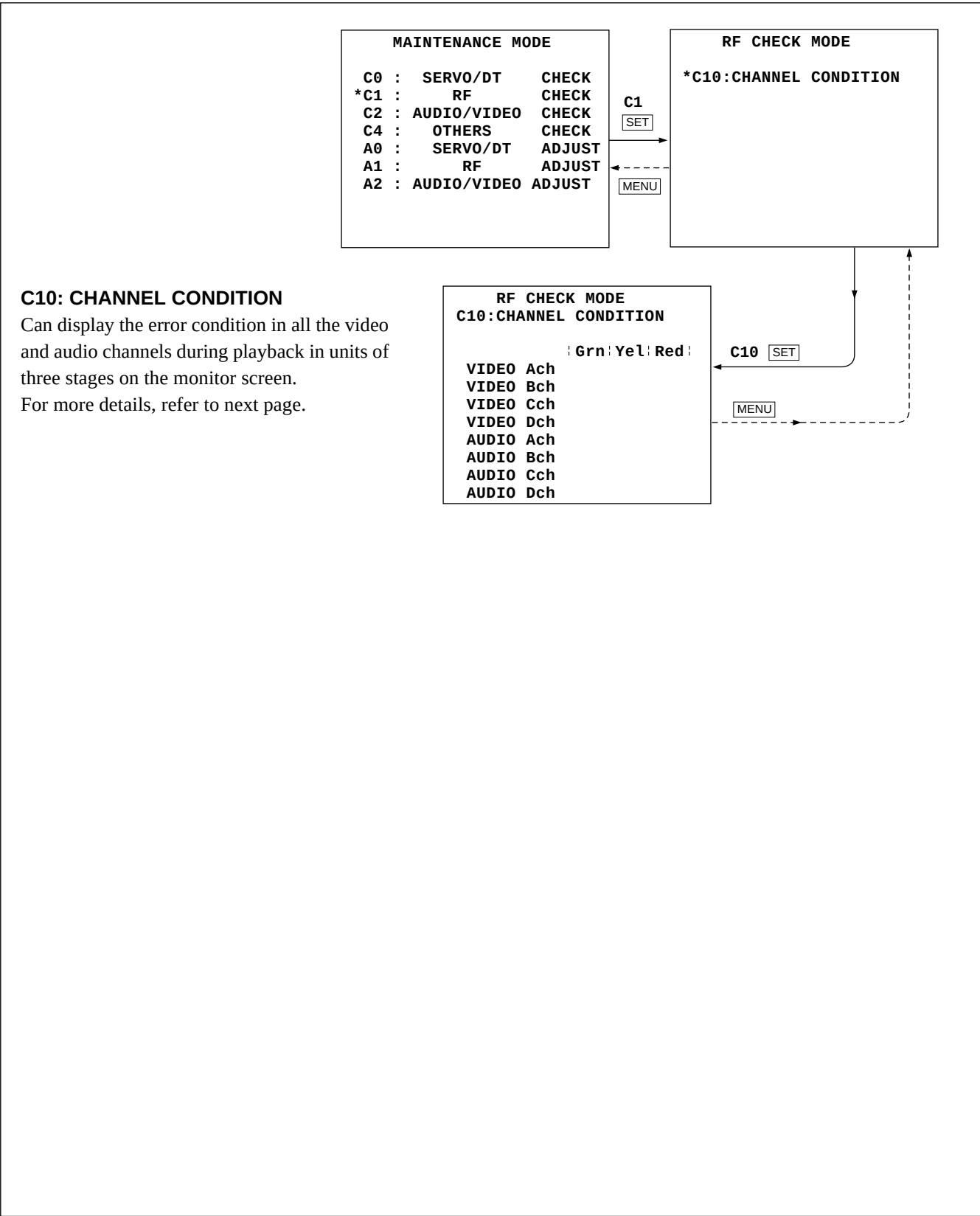
Execute the DT driver check (C050: DT DRIVER CHECK).

If no abnormality is found in this case, check the advance head/strain gauge of the inner drum or its signal transmission system (slip ring etc.).



5-3. RF System Check Mode (C1: RF CHECK)

This mode can check the RF system.
For how to activate and terminate the maintenance mode, refer to page 5-4.



a) C10: CHANNEL CONDITION

This mode can display the error condition in all the video and audio channels during playback in units of three stages on the monitor screen.

The channel condition indicator on the upper control panel indicates the error condition in the worst channel among all the video and audio channels.

- (1) Press the SET button (or switch S300 on the SS board) on the screen at right.
At that time, the unit temporarily exits the maintenance mode. This enables the normal operation.
(Prompt “■” is displayed in the upper right position of the superimposed screen, and the time counter is put into the normal state.)
- (2) Insert the cassette tape recorded by the digital Betacam and play back it in PLAY mode. The “>>>” display then appears on the monitor screen.

Confirm that the “>>>” display appears in the Grn position in all the channels.

- (3) To terminate the operation, stop the tape running and eject the cassette tape.
(The “>>>” display disappears.)
Press the MENU button (or switch S301 on the SS board) to return to the maintenance mode.
(The “■” display disappears on the monitor screen, and the time counter displays menu number C10.)

When the “>>>” display appears in the positions other than “Grn”, clean the drum (rotary head).

- (a) Cleaning by the cleaning tape (Refer to Section 2-9-1.)

* Cleaning time is five seconds.

- (b) Cleaning by the cleaning cloth (Refer to Section 2-9-2.)

If the channel condition is not improved after performing the step (a) and (b), there is a possibility to improve the situation by use of cleaning tape repeatedly. It should be less than 4 times of 5 seconds cleaning in total.

If the channel condition is not improved in the way mentioned above, the possible causes below are considered.

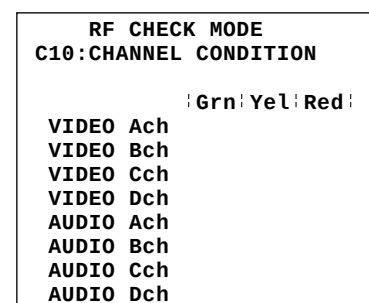
Playback tape fault:

- The tape is damaged.

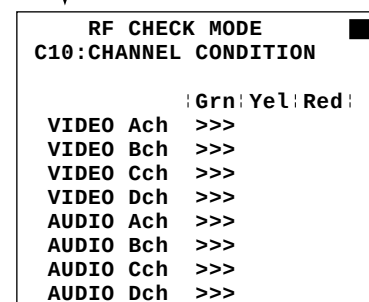
- The recording state is bad.

Main unit faults:

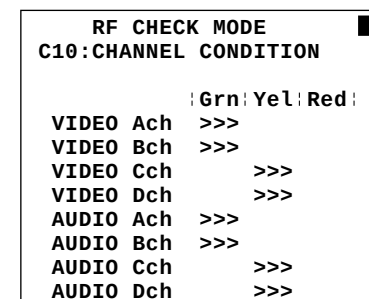
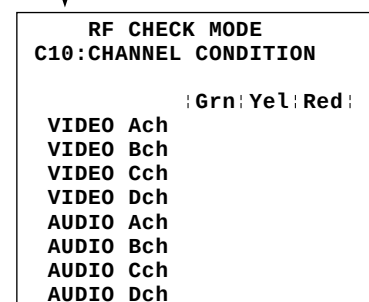
- Tape running system adjustment defect/part installation defect
- RF system adjustment defect
- DT system adjustment defect
- Worn head
- Harness defect
- Brush/slip ring defect
- Circuit defect



- (1) SET or S300
- (2) Playback

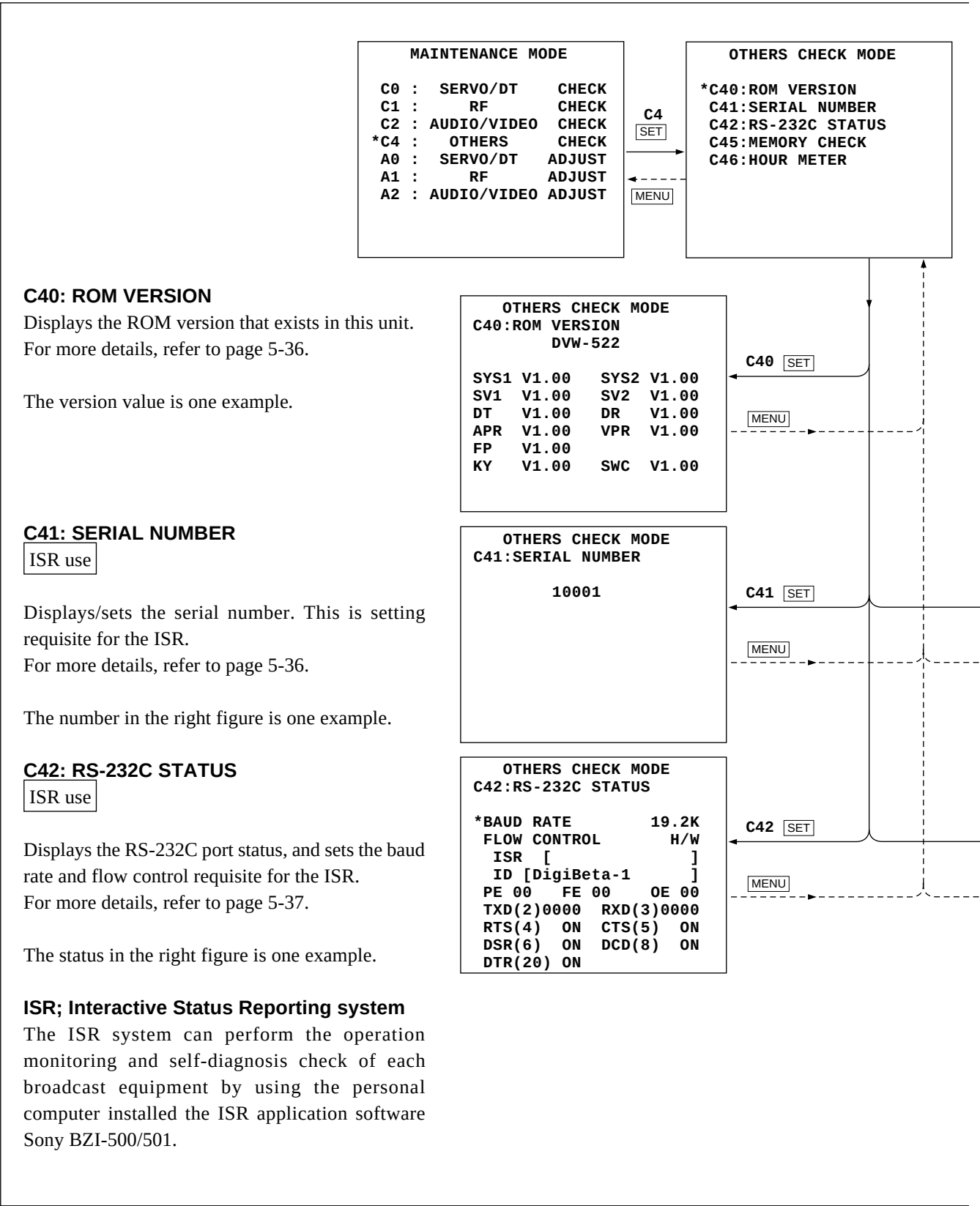


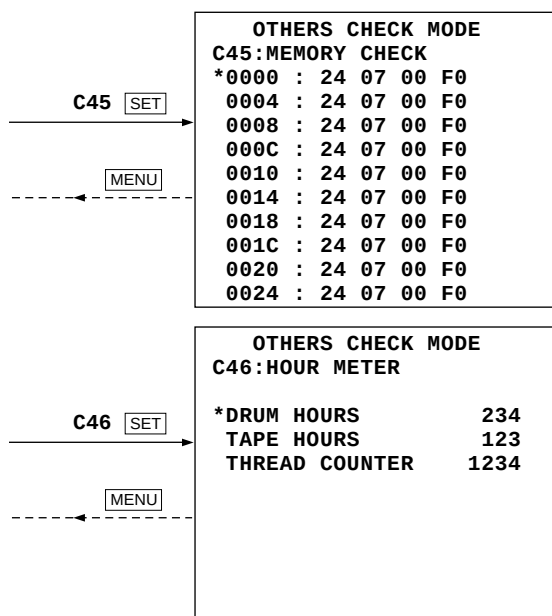
- (3) EJECT
MENU or S301



5-4. Others Check Mode (C4: OTHERS CHECK)

This section describes the “C4: OTHERS CHECK” mode.
For how to activate and terminate the maintenance mode, refer to page 5-4.





C45: MEMORY CHECK

CAUTION

This menu is intended for factory use.
Never change the data.

C46: HOUR METER

Can display and reset the resetable hours meter and thread counter of this unit.

For more details, refer to page 5-38.

The data value in the figure at left is one example.

a) C40: ROM VERSION

This mode displays the version of the ROM (including the ROM in a microprocessor) that exists in this unit.

The display description is shown below.

OTHERS CHECK MODE			
C40:ROM VERSION			
DVW-522			
SYS1	V1.00	SYS2	V1.00
SV1	V1.00	SV2	V1.00
DT	V1.00	DR	V1.00
APR	V1.00	VPR	V1.00
FP	V1.00		
KY	V1.00	SWC	V1.00

This version value is one example.

Displays the model name.

OTHERS CHECK MODE
C40:ROM VERSION
DVW-522

①

➡

SYS1

V1.00

③

➡

SV1

V1.00

⑤

➡

DT

V1.00

⑦

➡

APR

V1.00

⑨

➡

FP

V1.00

⑩

➡

KY

V1.00

SYS2

V1.00

➡

②

SV2

V1.00

➡

④

DR

V1.00

➡

⑥

VPR

V1.00

➡

⑧

SWC

V1.00

➡

⑪

①

SYS1

:

IC12 on SS-52 board

②

SYS2

:

IC54 on SS-52 board

③

SV1

:

IC761 on SS-52 board

④

SV2

:

IC700 (microprocessor) on SS-52 board

⑤

DT

:

IC211 on SS-52 board

⑥

DR

:

IC3 (microprocessor) on DR-200 board

⑦

APR

:

IC51 (microprocessor) on APR-1 board

⑧

VPR

:

IC753 (microprocessor) on VPR-1 board

⑨

FP

:

IC6 (microprocessor) on FP-58 board

⑩

KY

:

IC1 (microprocessor) on KY-231 board

⑪

SWC

:

IC2 (microprocessor) on SWC-19 board

b) C41: SERIAL NUMBER

ISR use

Displays/sets the serial number. This is setting requisite for the ISR.

Setting performs at each digit. (Blinking a digit can change.)

Displays “-----” when the serial number is not set.

Setting

- (1)

Trun the search dial(JOG mode) to blinking digit.
- (2)

Trun the search dial while pressing the JOG button to display the desire number.
- (3)

For other digits to be set, repeat steps (1) and (2).
- (4)

Press the SET button (or switch S300 on the SS board).
- Setting is then completed.

OTHERS CHECK MODE	
C41:SERIAL NUMBER	
10001	

Above screen is one example.

c) C42: RS-232C STATUS

ISR use

Displays the RS-232C port status, and sets the baud rate and flow control requisite for the ISR.

Setting (Baud rate or Flow control)

- (1) Align “*” mark with the item to be set using the search dial(JOG mode).
- (2) To display the desire setting, turn the search dial while pressing the JOG button.
- (3) Press the SET button (or switch S300 on the SS board). Setting is then completed.

The display description is shown below.

OTHERS CHECK MODE			
C42:RS-232C STATUS			
*BAUD RATE	19.2K		
FLOW CONTROL	H/W		
ISR [	]		
ID [DigiBeta-1	]		
PE 00	FE 00	OE 00	
TXD(2)0000	RXD(3)0000		
RTS(4) ON	CTS(5)	ON	
DSR(6) ON	DCD(8)	ON	
DTR(20) ON			

Above screen is one example.

- ① Selects the baud rate from the followings.
1200, 2400, 4800, 9600, 19.2K (bps)
- ② Selects/changes the flow control of transmitting side from the followings.
H/W ; Hardware control
XOFF ; XON/XOFF control
H/W,XOFF ; Both the hardware and XON/XOFF
- ③ Protocol state indication
ISR x[yyyy.....]
 - Displays last correctly receiving command
(Displays former receiving command till ACK transmitting is completed.)
 - Displays the protocol status of the unit.
A ; on ACK transmission
N ; on NAK transmission
T ; on ATN (OPC or QRESP) transmission
W ; waiting for ACK
X ; XOFF received, waiting for XON
- ④ Device ID is displayed a name that sets by DEVID command of ISR protocol.
Even if the power is turned off, this device ID is kept till it changes by DEVID command.
- ⑤ Displays the number of the parity error (PE), framing error (FE), and overrun error (OE) of receiving data.
- ⑥ The number with () indicates the pin number of RS-232C connector.
The four figures (hexadecimal) at TXD or RXD indicates the number of correctly transmitting or receiving data (byte).
Other items indicates the pin state with ON(> +3 V) or OFF(< -3 V).
When RS-232C port connects with computer &c., normally turns all ON.
When not connected, the state of input pins (CTS, DSR, DCD) are undefined.

OTHERS CHECK MODE			
C42:RS-232C STATUS			
*BAUD RATE	19.2K	←	①
FLOW CONTROL	H/W	←	②
ISR [	]	←	③
ID [DigiBeta-1	]	←	④
PE 00	FE 00	OE 00	← ⑤
TXD(2)0000	RXD(3)0000		← ⑥
RTS(4) ON	CTS(5) ON		
DSR(6) ON	DCD(8) ON		
DTR(20) ON			

d) C46: HOUR METER

This mode can display and reset the resetable hours meter and thread counter of this unit.

Display description

DRUM HOURS : Drum rotation time (H12)
 TAPE HOURS : Tape running time (H13)
 THREAD COUNTER : Number of threading times (H14)

Resetting

- (1) Align the“*” mark with the item to be reset using a search dial (JOG mode).
- (2) Turn the search dial in the reverse direction while pressing the JOG (or SHUTTLE) button. The display value then becomes zero (“0”).
 To return the display value to the former value after that, turn the search dial in the forward direction.
- (3) For other items to be reset, repeat steps (1) and (2).
- (4) Press the SET button (or switch S300 on the SS board). Resetting is then completed.

OTHERS CHECK MODE	
C46: HOUR METER	
*DRUM HOURS	234
TAPE HOURS	123
THREAD COUNTER	1234

This value is one example.

Section 6

Replacement of Plug-in Boards

6-1. General Information for Boards Replacement

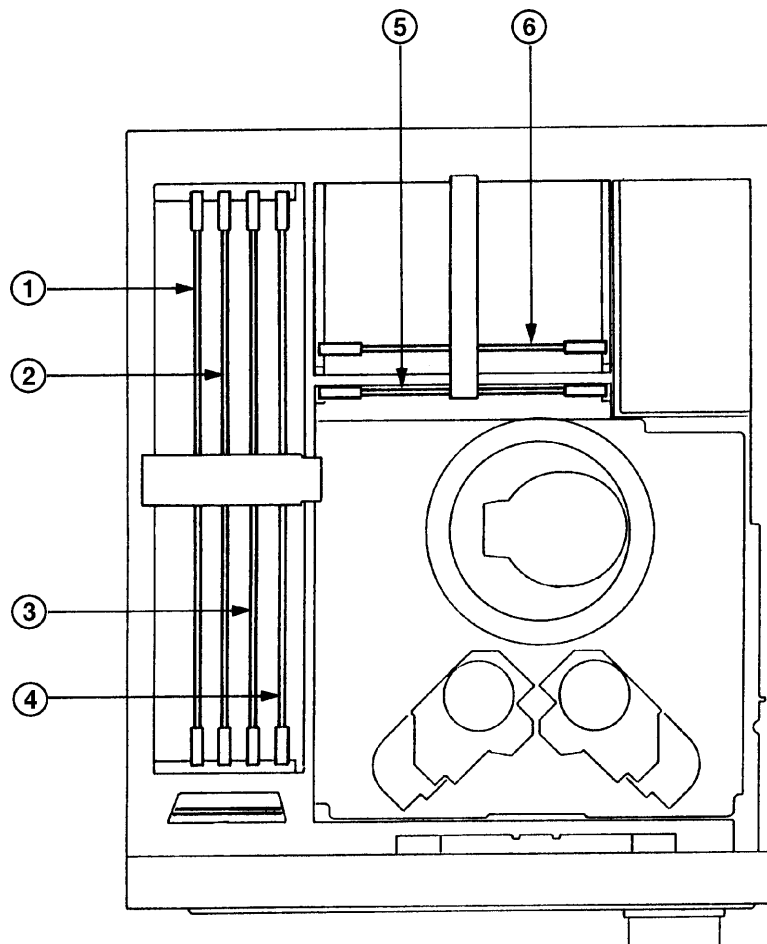
For how to activate and terminate the maintenance mode, refer to Section 5-1-1.

6-1-1. Index for Board Replacement

[Index]

Board	Electrical Alignment	Location
APR-1	Section 6-3.	③
CUE-1	Section 6-5.	⑥
*DPR-36	——	②
EQ-45	Section 6-4.	⑤
SS-52	Section 6-6.	④
VPR-1	Section 6-2.	①

*DPR-36 board does not need the electrical alignment.

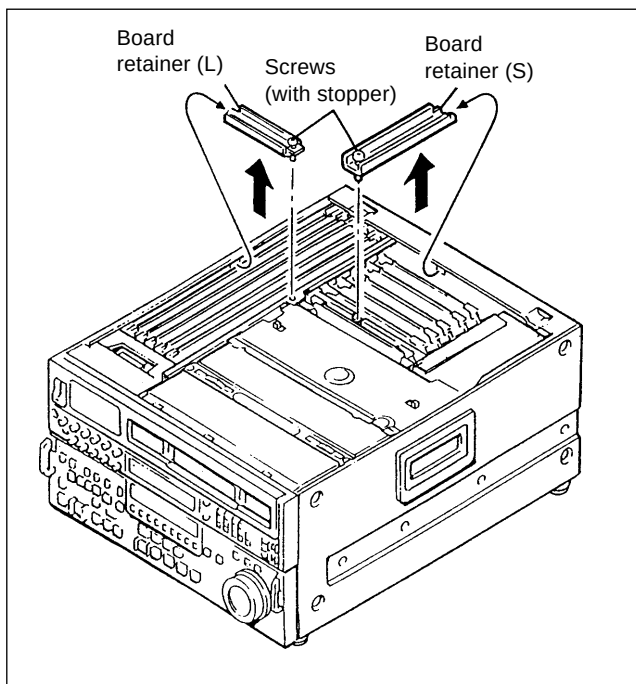


6-1-2. Plug-in Board Pulling Out/ Inserting

Always switch off the power before removing or installing the plug-in board.

Pulling out

1. Loosen a screw, and remove the board retainer (L) or (S).

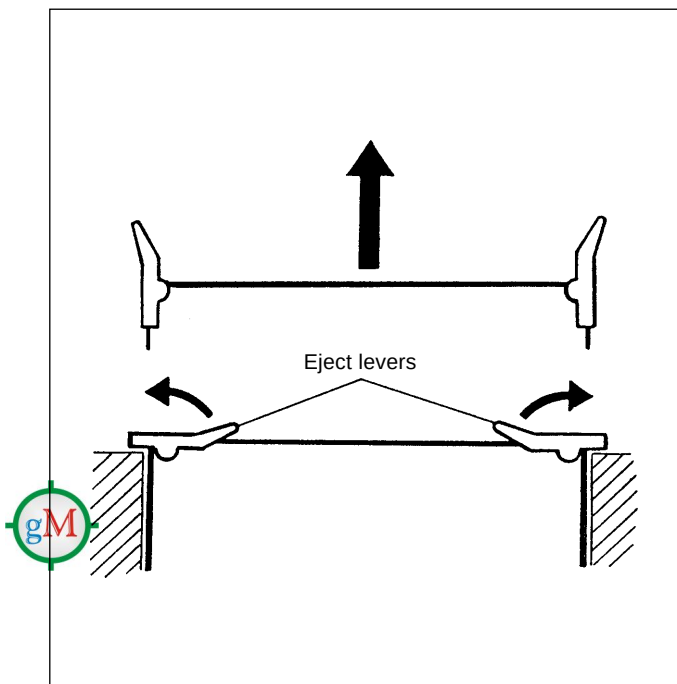


2. Pull up the eject levers on the board in the direction of the arrows when pulling out the board from the connector.

Note

Do not try to pull the board by grasping any of the components on the board.

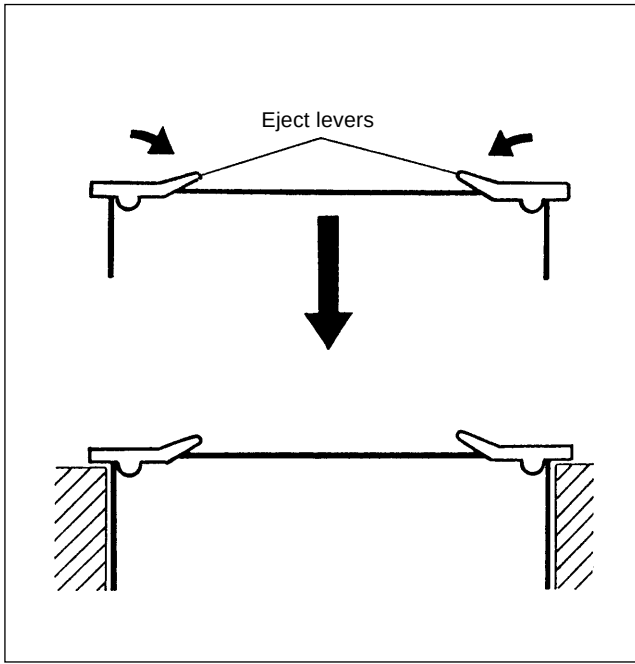
Pull out the board with equal force for both sides.



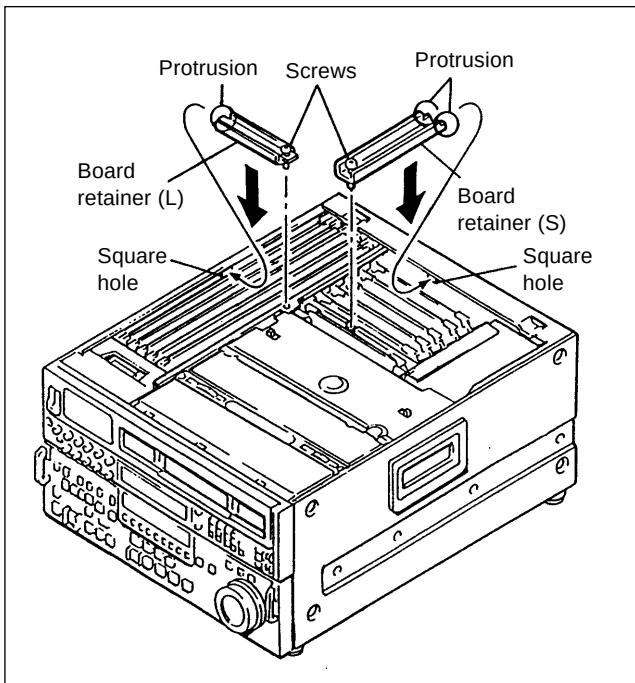
3. Disconnect the connected harness.

Inserting

4. Connect the disconnected harness.
5. Insert the board after pushing down the eject levers as shown in the figure.



6. Insert the protrusion of the board retainer (L) or (S) into the square hole, and tighten the screw.



6-2. Adjustment after VPR-1 Board Replacement

6-2-1. Video Output Level Adjustment

Preparation

On the set-up menu ITEM 713, set as follows (for NTSC):
ITEM 713: VIDEO SETUP REFERENCE LEVEL

- | | | |
|---|------------------|---------|
| 1 | MASTER LEVEL | :0.0% |
| 2 | INPUT LEVEL | :— |
| 3 | VBLK REMOVE CNT | :— |
| 4 | BETACAM PB LEVEL | :— |
| 5 | OUTPUT LEVEL | :MASTER |

Tools

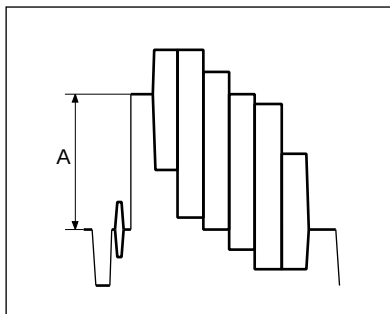
Measuring equipment: Waveform monitor

Procedures

STEP 1

1. Connect the waveform monitor to COMPOSITE 1 OUT connector.
2. Play back the 100% color bars portion (00:00 - 10:00) of the alignment tape ZR5-1/1P.
ZR5-1 : for NTSC
ZR5-1P : for PAL
3. On the menu of maintenance mode, set as follows:
A2: AUDIO/VIDEO ADJUST
A20: VPR VR 0
4. Adjust at VIDEO 1 LEVEL.
(When the search dial is turned while pressing the JOG button, the adjustment data can be changed.)

COMPOSITE 1/2 OUT



A = 100 ± 1 IRE (714 ± 7 mV p-p) (for NTSC)
A = 700 ± 7 mV p-p (for PAL)

STEP 2

1. Connect the waveform monitor to COMPOSITE 2 OUT connector.
2. Play back the 100% color bars portion (00:00 - 10:00) of the alignment tape ZR5-1/1P.
ZR5-1 : for NTSC
ZR5-1P : for PAL
3. On the menu of maintenance mode, set as follows:
A2: AUDIO/VIDEO ADJUST
A20: VPR VR 0
4. Adjust at VIDEO 2 LEVEL.
(When the search dial is turned while pressing the JOG button, the adjustment data can be changed.)

STEP 3

1. Save adjustment data.
2. On the menu of maintenance mode, set as follows:
A2F: NV-RAM CONTROL
3. Execute SAVE ALL ADJUST DATA.
4. After adjustment is completed, be sure to restore the setting datas of ITEM 713 to user's setting datas.

6-2-2. 27 MHz FREQ Adjustment

Procedures

STEP 1

1. Connect the frequency counter to TP1003 on the VPR-1 board.
2. On the menu of maintenance mode, set as follows:
A2: AUDIO/VIDEO ADJUST
A20: VPR VR 0
3. Adjust at 27 MHz FREQ.
(When the search dial is turned while pressing the JOG button, the adjustment data can be changed.)

Specifications: $27,000,000 \pm 100$ Hz

STEP 2

1. Save adjustment data.
2. On the menu of maintenance mode, set as follows:
A2F: NV-RAM CONTROL
3. Execute SAVE ALL ADJUST DATA.

6-2-3. PB Clock Phase Setting

Procedures

STEP 1

1. On the menu of maintenance mode, set as follows:
A2: AUDIO/VIDEO ADJUST
A20: VPR VR 0
2. Setting at PB CK27 DL.
(When the search dial is turned while pressing the JOG button, the setting data can be changed.)

Specifications: DATA "F0"

STEP 2

1. Save adjustment data.
2. On the menu of maintenance mode, set as follows:
A2F: NV-RAM CONTROL
3. Execute SAVE ALL ADJUST DATA.

6-3. Adjustment after APR-1 Board Replacement

6-3-1. CUE Monitor Output Level Adjustment

Tools

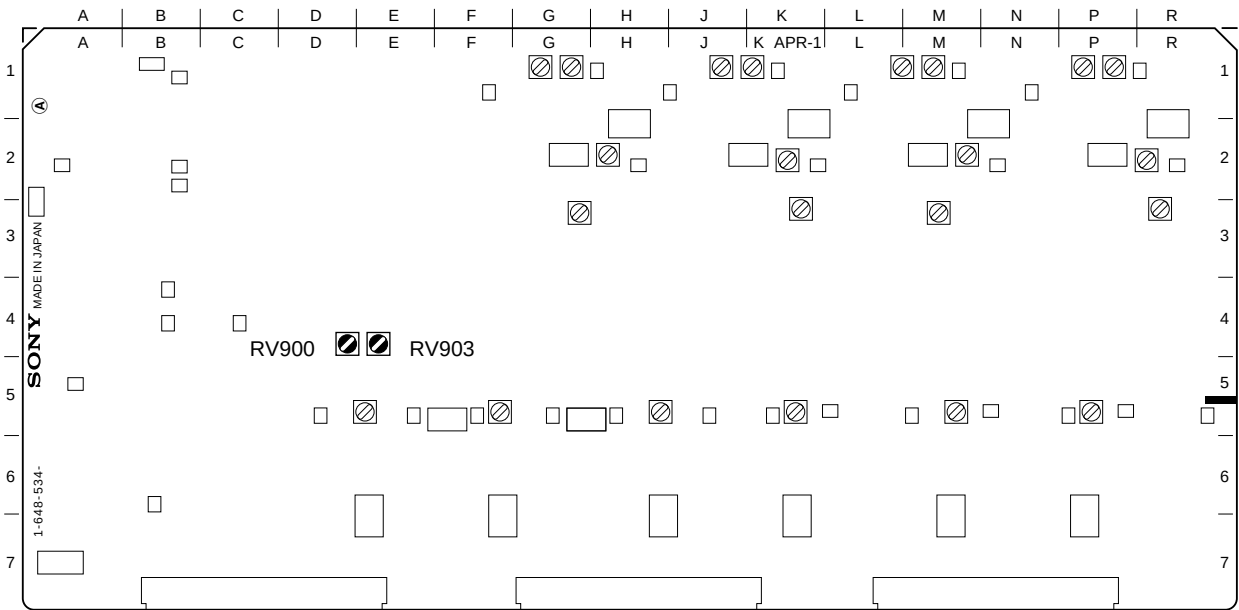
Measuring equipment: Audio analyzer

Procedures

STEP 1

- 1. Connect the audio analyzer to MONITOR OUTPUT L/R.
- 2. Select “CUE” at the “MONITOR SELECT L/R”.
- 3. Play back the 1 kHz, 0 VU signal portion (00:00 - 01:25) of the alignment tape ZR5-1/1P.
ZR5-1 : for NTSC
ZR5-1P : for PAL
- 4. Adjustments
MONITOR L: ●RV900/APR-1(D-4)
MONITOR R: ●RV903/APR-1(E-4)

Specifications: +4.0 ± 0.1 dBu (terminated by 600 Ω)



6-4. Adjustment after EQ-45 Board Replacement

6-4-1. ADV Envelope Level Adjustment

Tools

Measuring equipment: Oscilloscope

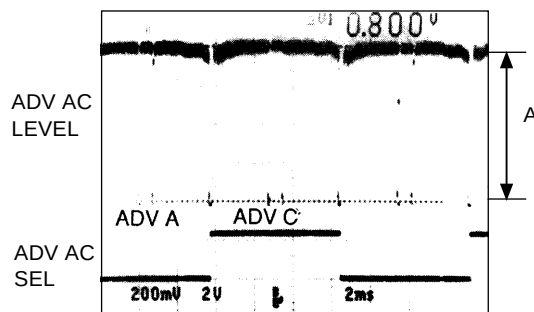
Procedures

STEP 1

1. Connect the oscilloscope to TP103 and TP423 on the EQ-45.
2. Play back the alignment tape ZR5-1/1P.
ZR5-1 : for NTSC
ZR5-1P : for PAL
3. On the menu of maintenance mode, set as follows:
A1: RF ADJUST
A19: ADV LEVEL
4. Adjust at Ach LEVEL.
(When the search dial is turned while pressing the JOG button, the adjustment data can be changed.)
5. Adjust at Cch LEVEL.
(When the search dial is turned while pressing the JOG button, the adjustment data can be changed.)

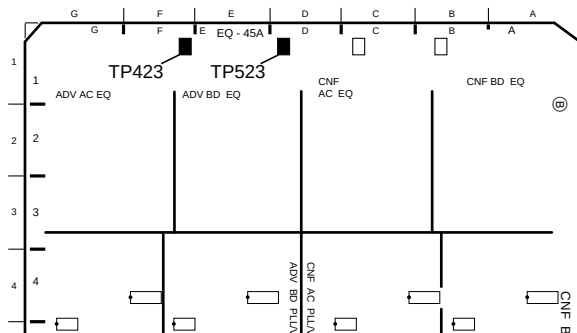
Oscilloscope

TP423/EQ-45(*F-1)



TRIG: TP103/EQ-45 (C-1)

A = 800 ± 100 mV



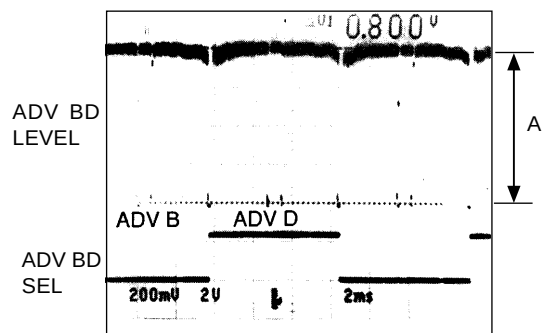
* B SIDE

STEP 2

1. Connect the oscilloscope to TP104 and TP523 on the EQ-45.
2. Play back the alignment tape ZR5-1/1P.
3. On the menu of maintenance mode, set as follows:
Ajust at Bch LEVEL.
(When the search dial is turned while pressing the JOG button, the adjustment data can be changed.)
4. Adjust at Dch LEVEL.
(When the search dial is turned while pressing the JOG button, the adjustment data can be changed.)

Oscilloscope

TP523/EQ-45(*D-1)

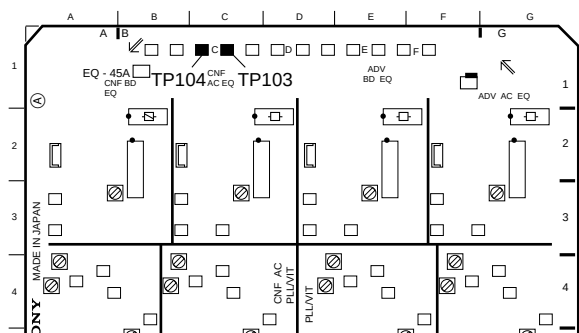


TRIG: TP104/EQ-45 (C-1)

A = 800 ± 100 mV

STEP 3

1. Save adjustment data.
2. On the menu of maintenance mode, set as follows:
A1F: NV-RAM CONTROL
3. Execute SAVE ALL ADJUST DATA.



A SIDE

6-4-2. PLL Adjustment

Preparation

Alignment tape ZR5-1/1P rewound in advance.

ZR5-1 : for NTSC

ZR5-1P : for PAL

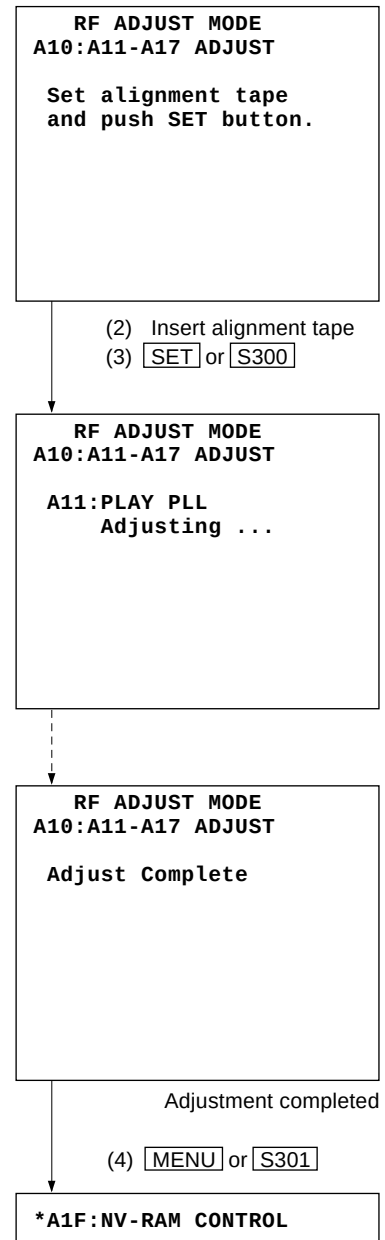
Procedures

STEP 1

1. On the menu of maintenance mode, set as follows:
A1: RF ADJUST
A10: A11-A17 ADJUST
2. Insert alignment tape ZR5-1/1P into this unit.
3. Press the SET button (or switch S300 on the SS board) to initiate the adjustment.
4. If no abnormality is found after all the adjustments are completed, the "Adjust Complete" message is displayed on the monitor screen.
5. Press the MENU button (or switch S301 on the SS board) to return to the RF ADJUST MODE menu screen.

STEP 2

1. Save adjustment data.
2. On the menu of maintenance mode, set as follows:
A1F: NV-RAM CONTROL
3. Execute SAVE ALL ADJUST DATA.



6-5. Adjustment after CUE-1 Board Replacement

6-5-1. CUE PB Frequency Response Adjustment

Tools

Measuring equipment: Audio analyser

Procedures

STEP 1

1. Select "CUE" at the "MONITOR SELECT L/R".
2. Play back the 1 kHz, 3 kHz, 7 kHz, 10 kHz, 12 kHz and 90 Hz (−20 VU) signal portions (1:30-4:55) of the alignment tape ZR5-1/1P.
 ZR5-1 : for NTSC
 ZR5-1P : for PAL
3. Adjustment: RV901/CUE-1(A-4)

Specifications

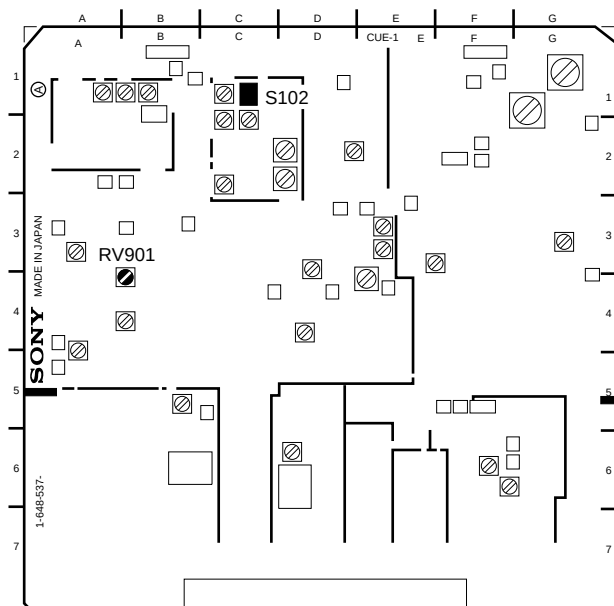
MONITOR OUTPUT L/R

FREQUENCY [Hz]	OUTPUT LEVEL [dB]
1 k	0 (REF)
3 k	0 ± 0.5
7 k	0 ± 0.5
10 k	0 ± 0.5
12 k	−0.2 ± 0.5
90	0 ± 0.7

Note

Correct output levels by correction value of the alignment tape.

When the specifications are not met, switch S102 and then perform this adjustment again.



6-5-2. CUE PB Level Adjustment

Tools

Measuring equipment: Audio analyser

Procedures

STEP 1

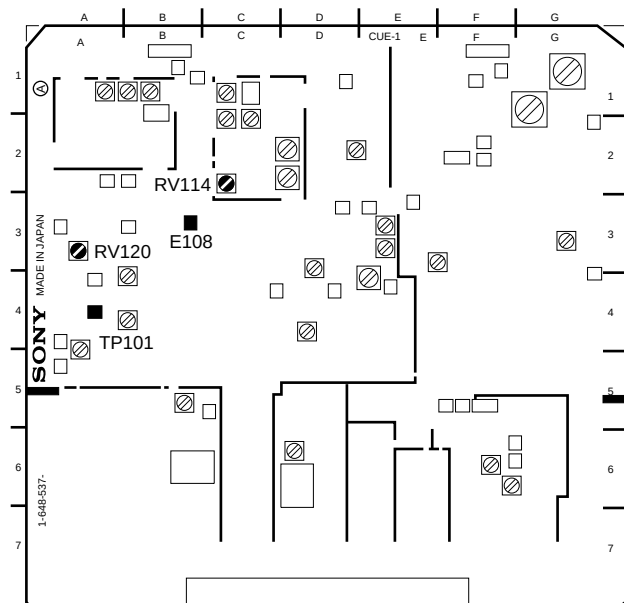
1. Short-circuit TP101 and E108 on the CUE-1 board with a shorting clip.
2. Play back the 1 kHz, 0 VU signal portion (00:00 - 01:25) of the alignment tape ZR5-1/1P.
ZR5-1 : for NTSC
ZR5-1P : for PAL
3. Adjustment: ⚙RV114/CUE-1(C-2)_PB LEVEL ADJ

Specifications: 4.0 ± 0.1 dBu (terminated by 600 Ω)

STEP 2

1. Disconnect the shorting clip.
2. Play back the 1 kHz, 0 VU signal portion (00:00 - 01:25) of the alignment tape ZR5-1/1P.
3. Adjustment: ⚙RV120/CUE-1(A-3)_PB REF ADJ

Specifications: 4.0 ± 0.1 dBu (terminated by 600 Ω)



6-6. Adjustment after SS-52 Board Replacement

6-6-1. Drum Servo System Adjustment

Preparation

Alignment tape ZR2-1/1P on which the beginning of the time code is beforehand located in 00:25:00:00 (50% FLAT FIELD) is required.

Alignment tape ZR2-1/1P rewound in advance.

ZR2-1 : for NTSC

ZR2-1P : for PAL

Procedures

STEP 1

- On the menu of maintenance mode, set as follows:
A0: SERVO/DT ADJUST
A00-01: SERVO ADJUST
A011: RF SWITCHING POS
- Set the “*” mark to **AUTO** using a search dial (JOG mode).
- Press the SET button (or switch S300 on the SS board).
The monitor screen changes as shown at right.
- Insert alignment tape ZR2-1/1P into this unit.

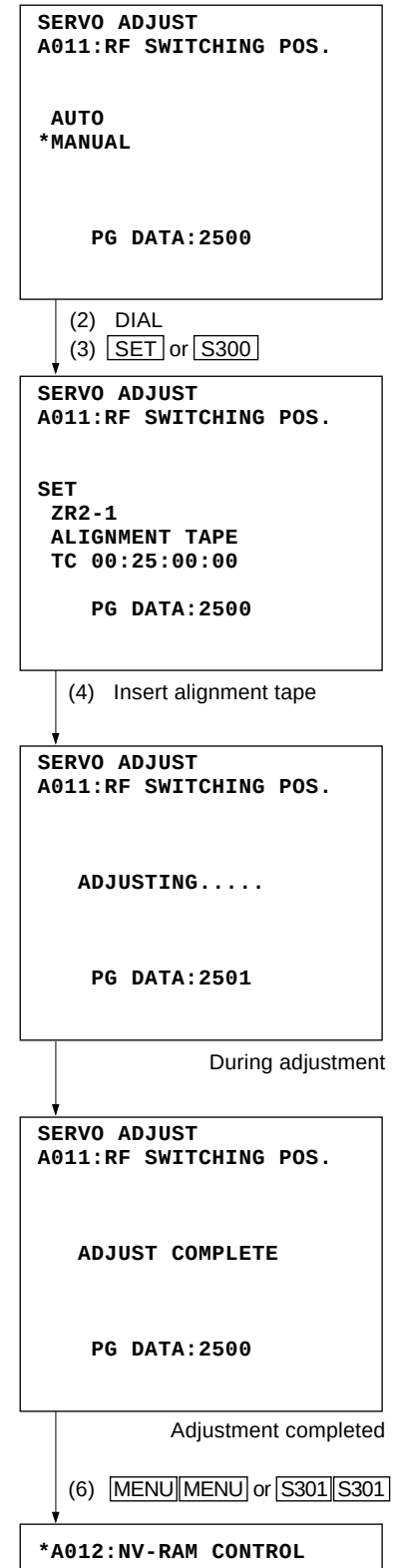
Note

Be sure to use alignment tape ZR2-1/1P. If not, the adjustment is not performed correctly even if the “ADJUST COMPLETE” message is displayed after adjustment is completed.

- After adjustment is completed, the “ADJUST COMPLETE” message is displayed on the monitor screen.
The alignment tape is then ejected automatically.
- Press the MENU button (or switch S301 on the SS board) two times to return to the SERVO ADJUST menu screen.

STEP 2

- Save adjustment data.
- On the menu of maintenance mode, set as follows:
A012: NV-RAM CONTROL
- Execute SAVE ALL ADJUST DATA.

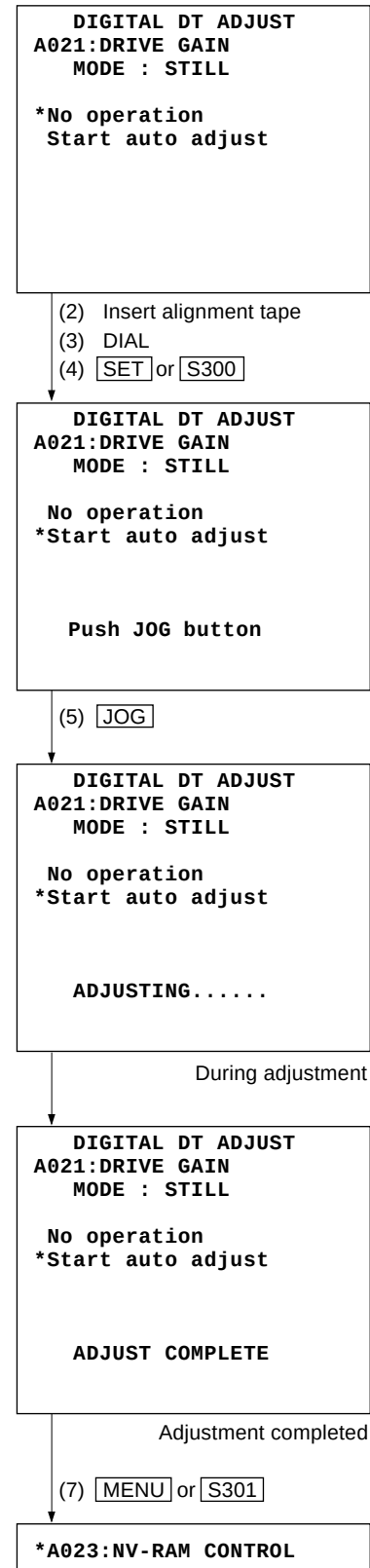


6-6-2. Digital DT System Adjustment

Procedures

STEP 1

- On the menu of maintenance mode, set as follows:
A0: SERVO/DT ADJUST
A02: DIGITAL DT ADJUST
A021: DRIVE GAIN
- Insert alignment tape ZR5-1/1P into this unit.
ZR5-1 : for NTSC
ZR5-1P : for PAL
- Set the "*" mark to **Start auto adjust** using a search dial (JOG mode).
- Press the SET button (or switch S300 on the SS board).
(If the unit has already entered the STILL mode, the adjustment is initiated.)
- The "Push JOG button" message is displayed on the monitor screen.
Press the JOG button. The unit then enters the STILL mode to initiate the adjustment.
- After adjustment is completed, the "ADJUST COMPLETE" message is displayed on the monitor screen.
- Press the MENU button (or switch S301 on the SS board) to return to the DIGITAL DT ADJUST menu screen.

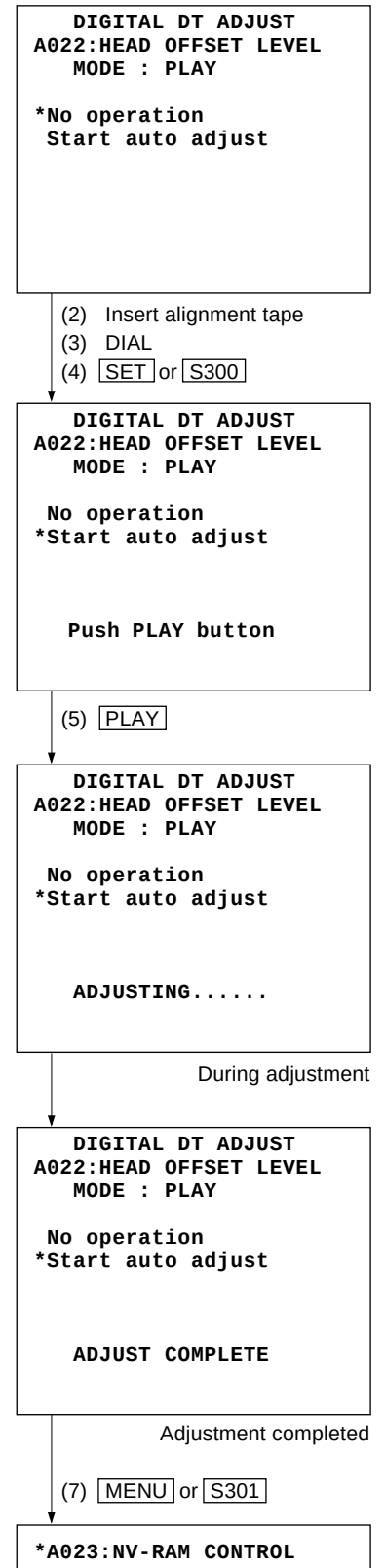


STEP 2

1. A022: HEAD OFFSET LEVEL
2. Insert alignment tape ZR5-1/1P into this unit.
3. Set the “*” mark to Start auto adjust using a search dial (JOG mode).
4. Press the SET button (or switch S300 on the SS board).
(If the unit has already entered the STILL mode, the adjustment is initiated.)
5. The “Push PLAY button” message is displayed on the monitor screen.
Press the PLAY button to initiate the adjustment.
6. After adjustment is completed, the “ADJUST COMPLETE” message is displayed on the monitor screen.
7. Press the MENU button (or switch S301 on the SS board) to return to the DIGITAL DT ADJUST menu screen.

STEP 3

1. Save adjustment data.
2. On the menu of maintenance mode, set as follows:
A023: NV-RAM CONTROL
3. Execute SAVE ALL ADJUST DATA.



Section 7

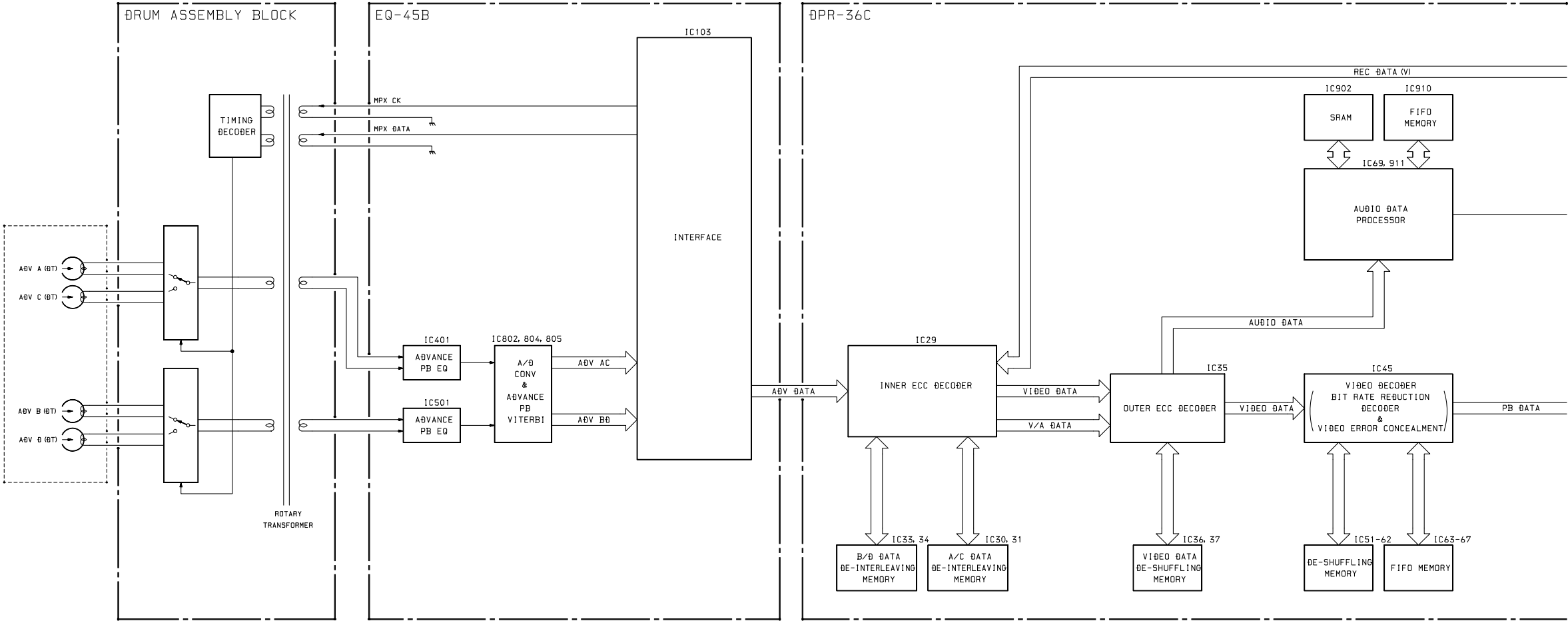
Block Diagrams

7-1. Circuit Function of Printed Circuit Board

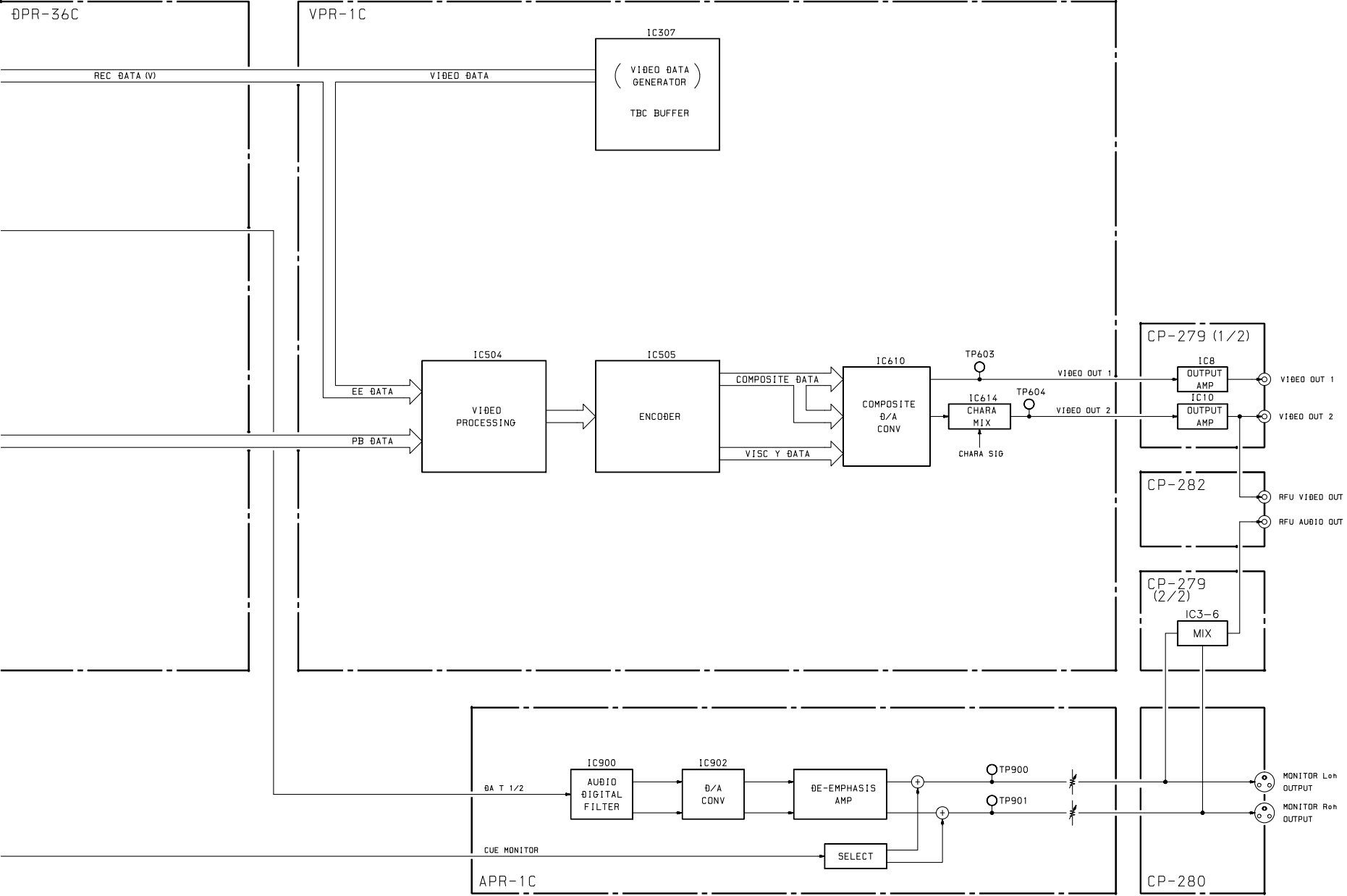
Board Name (Part No.)	Circuit Function
VPR-1 (A-8275-911-A: for PAL) (A-8275-912-A: for NTSC)	Video signal processor, D/A, Reference clock generator, Composite encoder
APR-1 (A-8275-919-A: for PAL) (A-8275-908-A: for NTSC)	Audio signal processor, D/A interface
DPR-36 (A-8275-903-A: for PAL) (A-8275-904-A: for NTSC)	Digital data processor (Decode, Error correction)
EQ-45 (A-8275-358-A: for PAL) (A-8275-360-A: for NTSC)	PB RF equalizer
CUE-1 (A-8275-909-A: for PAL) (A-8275-910-A: for NTSC)	CUE/LTC PB circuits
SS-52 (A-8275-913-A: for PAL) (A-8275-902-A: for NTSC)	System, Servo, Digital DT control
DT-34	DT driver
DR-200	Motors driver (Drum, Capstan, S/T reels, Threading, Reel shift, Cassette up/down) Solenoids driver (Pinch, S/T brake, Cleaning)
CCM-15	Threading motor / Reel-shift motor
PD-35	Pinch solenoid connection
PTC-54	Threading FG
PTC-59	Cassette's tabs sensor
PTC-71	Reel position sensor
RM-82	S/T reel motor
SE-228	S/T reel FG
TR-78	S tension sensor
TR-79	T tension sensor, Thread/Unthread end sensor
CL-29	Cassette up/down motor, Cassette down sensors
PC-70	Cassette-in sensor, Cassette size sensor
FP-58	Upper panel function (SWs, LEDs) control
VR-152	Phone level RV, Phone connector
VR-207	Audio PB level circuit
SWC-17	Monitor select VTR status indicators (SWs, LEDs)
SWC-19	System set-up panel function control
KY-231	Lower control panel function
DP-176	Time counter display
PTC-69	Search dial sensor, Dial solenoid connection
CP-279	Rear connector board (Analog video) with output drivers
CP-280	Rear connector board (Analog audio)

Board Name (Part No.)	Circuit Function
CP-282	Rear panel connector board (RF adaptor)
AC-139	AC connector board with breaker
SOPS-1019C	Switching regulator
SOPS-1042A	Switching regulator (inc. SOPS-1019C/1042S boards)
SOPS-1042D	Switching regulator (AC-DC)
SOPS-1042S	Switching regulator
MB-441	Mother board
HN-181	Connection board (Drum/Capstan/Reel-shift motors, CTL head, DT-34/HN-184/HN-185/PTC-59/PTC-71 boards)
HN-184	Connection board (Threading motor, Tape end sensor, and PD-35/PTC-54/TR-78 boards)
HN-185	Connection board with dew sensor (Tape top sensor, Cassette compartment, TR-79 board, Slip ring)

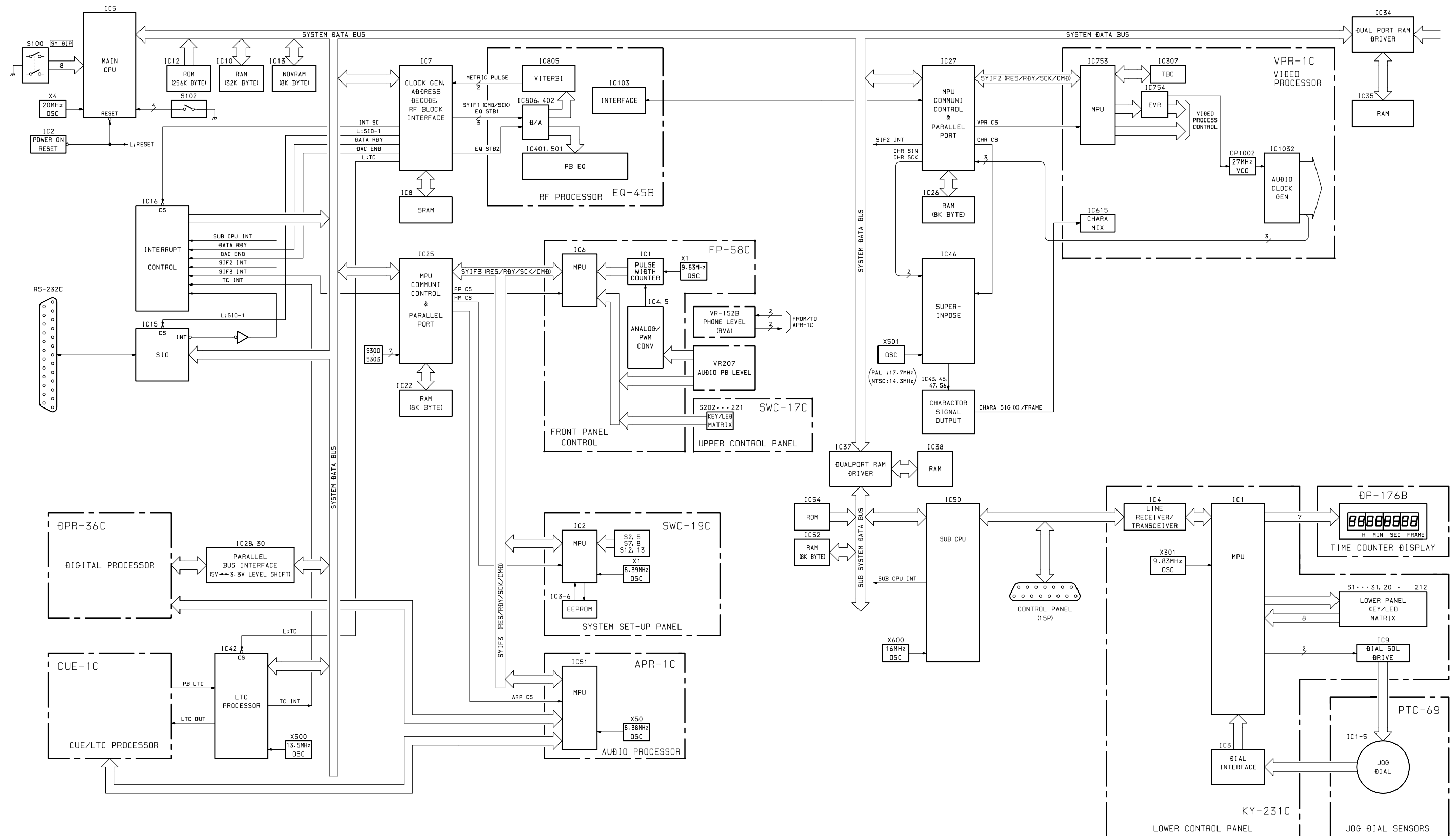
7-2. Overall



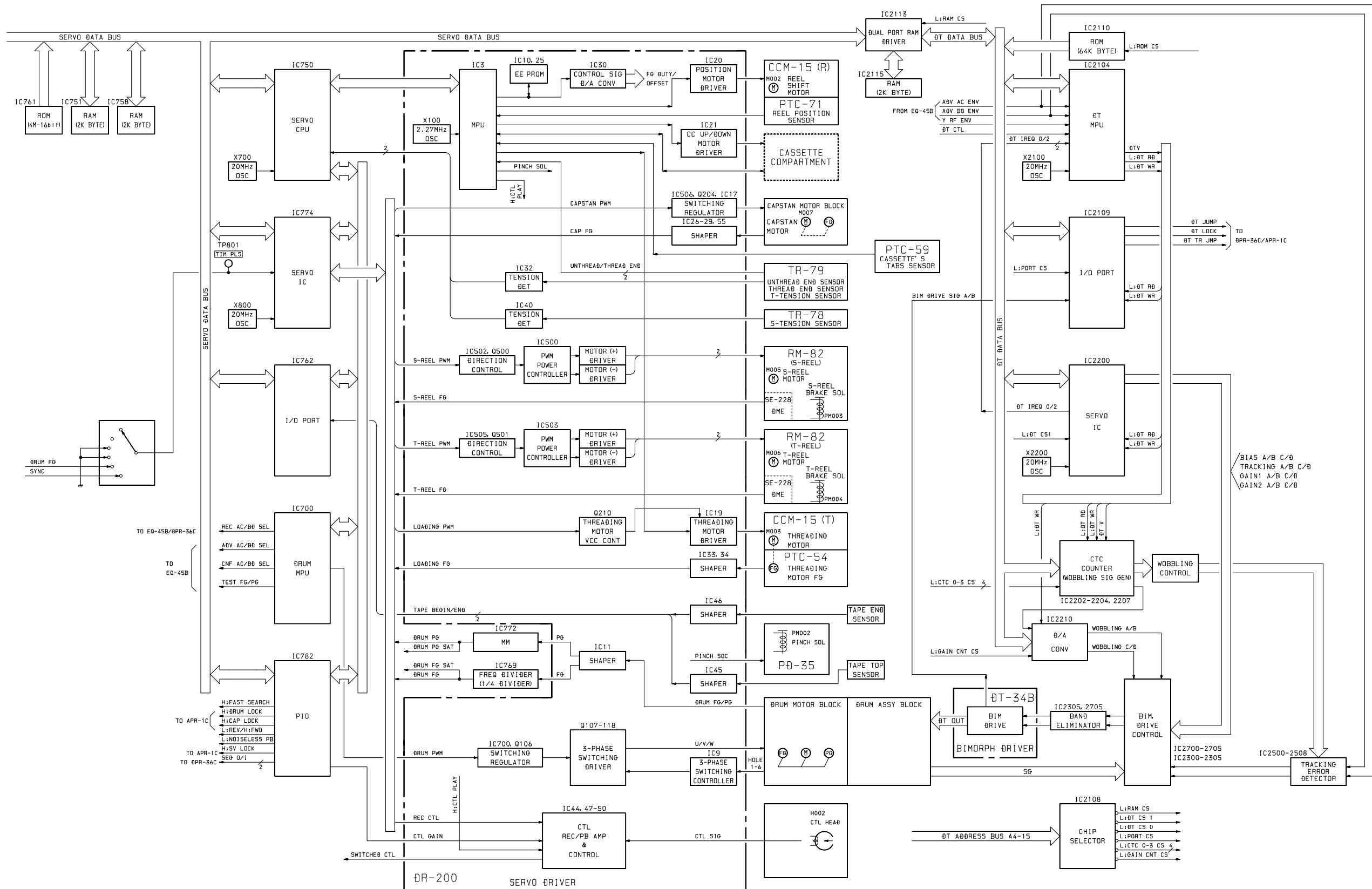
Signal Processing System
OVERALL (1/4)
DVW-522/522P



Signal Processing System
OVERALL (2/4)
DVW-522/522P



Control System
OVERALL (3/4)
 SS-52B Board Circuit to Other Boards
 DVW-522/522P



Control System
OVERALL (4/4)
 SS-52B Board Circuit to Other Boards
 DVW-522/522P

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SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 3.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 5.25 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 20 V AC range are suitable. (See Fig. A)

